MOTOR AGE

Vol. XXXI
No. 21

CHICAGO MAY 24, 1917

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In This Issue—The Army Type Road

Van Sicklen

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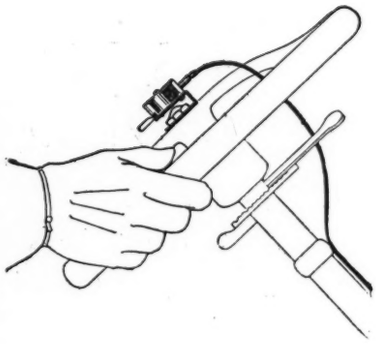

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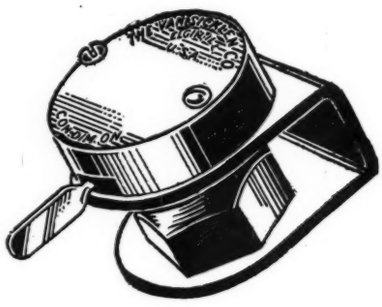

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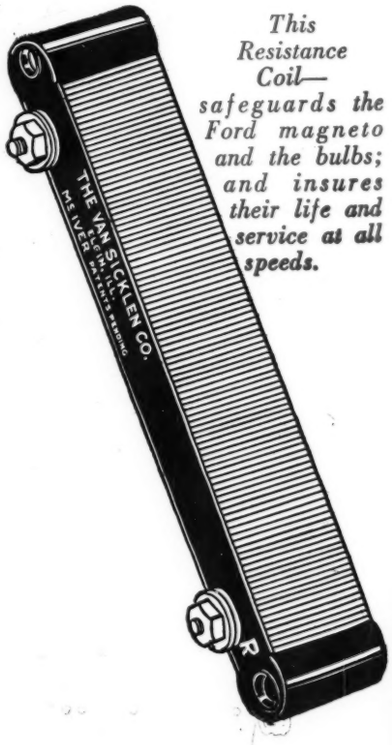

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MOTOR AGE

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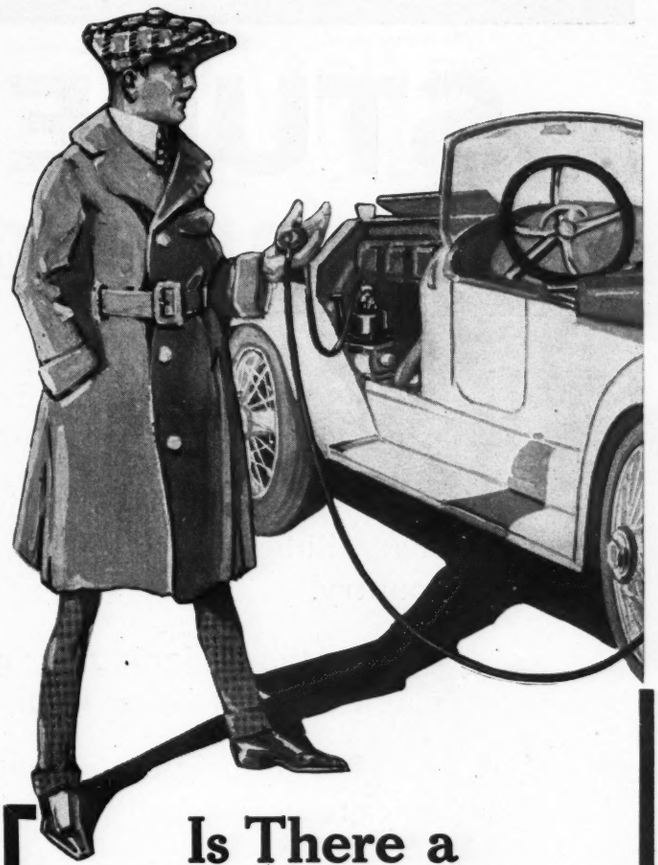
ANNOUNCEMENT

The feature of Motor Age for next week will be an inside story on the use of motor trucks by the United States army as made in the Pershing expedition into Mexico and on the border. In view of the present situation the story is particularly opportune.



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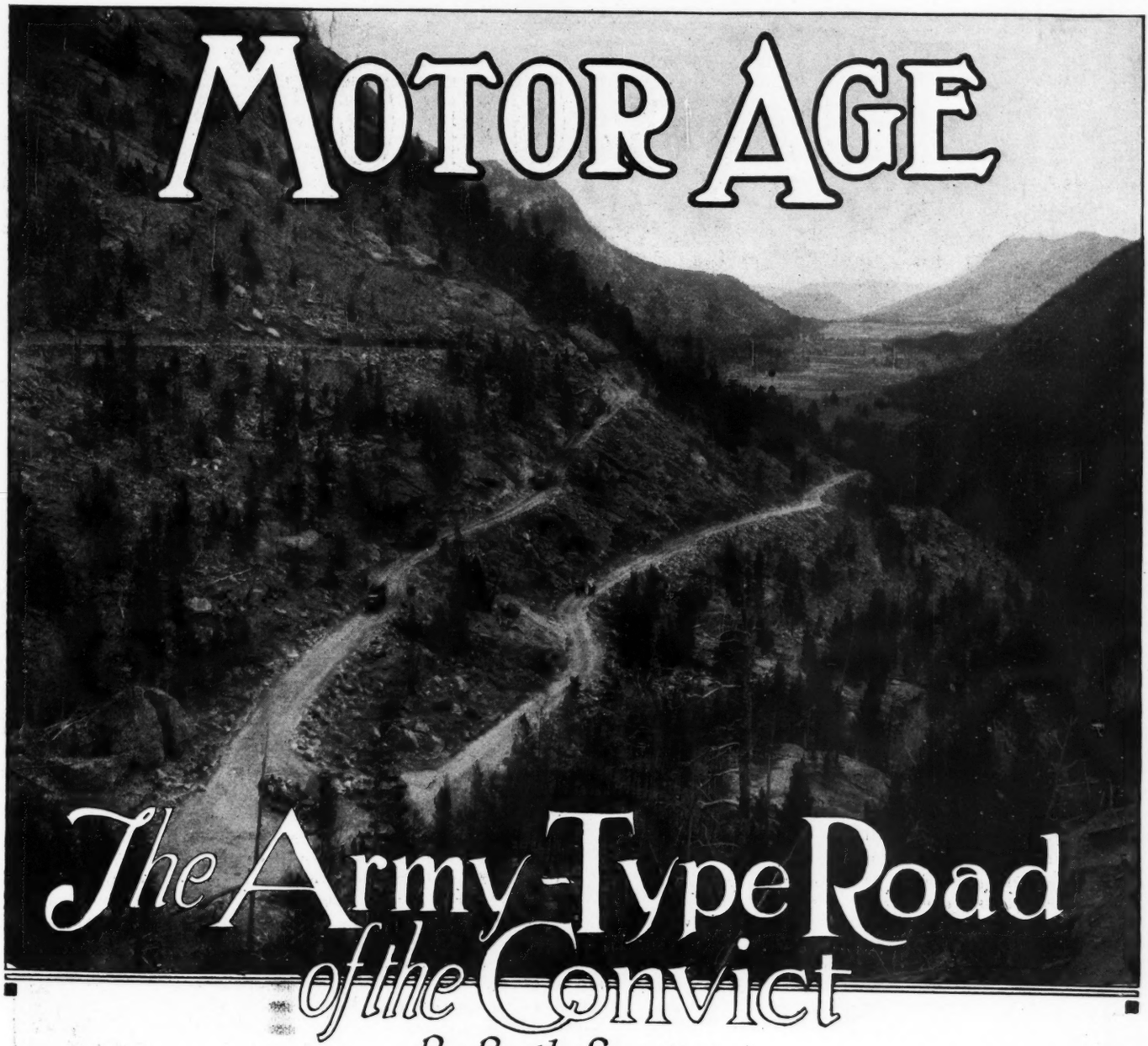
MOTOR AGE



The Army-Type Road of the Convict

By Ruth Sanders

THE army-type roads of to-day lend themselves gracefully to the passage of many motor cars and motor trucks. No modern fighting force is complete without them, and no nation is fully equipped unless they are included in its assets.

Europe has had this truism brought home in the present war, and we are apt to have it brought home, are having it brought home in sections where railroad transportation has ceased to suffice and motor trucks are used for long-distance, as well as local, hauls. Italy, since she entered the war, has had an army of 20,000 men constantly engaged in building roads for motor cars and motor trucks along her war front—the army-type roads, because motor vehicles are mighty factors in this, the mighty war.

The same is true in France. Roads are as essential as guns, men, clothing, munitions and acres on which to grow crops. And if these roads are to serve equally with the other essentials they must be permanent roads that will stand motor vehicular traffic, just as the gun the soldier carries must be a Springfield or of equal modernity rather than a pop-gun if he is to have any chance of victory against the enemy.

Fall River road above Estes Park and into Rocky Mountain National Park — Switchback built by Colorado convicts

The United States is not entirely devoid of the army-type roads—far from it. The United States has not enough of them, however. That is the trouble. The Mississippi Valley, the southern regions that bound the Mexican border, the Atlantic and the Pacific coasts should be tied unbreakably together with roads over which motor cars and motor trucks could travel without difficulty.

Such roads are the famous Skyline Drive of Colorado and the Columbia River highway of Washington, built entirely by state convicts, the white ribbons that trace the map of California, the highways that connect the resorts of New Jersey, the vacation regions of New York, Michigan and any number of sections in other states, many of which roads are the result of convict labor.

A road map of the United States shows a very network of highways and connecting roads. If all these routes were like the roads the state wards have built, of which the Skyline Drive is perhaps the most famous example, we would have the army-type roads which Italy's army of 20,000 is building and which France is constructing. The road built by the convicts to-day has

A convict road camp in Virginia. This state has thirty-four of these camps now, and between 1900 and 2000 convicts are building permanent roads

the passage of motor cars and motor trucks in mind, and hence is of the army type.

The employment of state convicts in road making first became general in the South in the early nineties. Use of state convicts for road work has been made by northern and western states, as a whole, mostly during the last ten years. To-day practically every state makes more or less extended use of its convicts in building highways.

Space will not permit this article to go fully into the use of convict labor on the public roads. It can only point out the road work that already has been done by the convict in this country with the suggestion of the possibilities dormant in the full road-building powers of state prisoners. Inasmuch as motor travel is of constantly increased importance in the intercommunication of the people and the cities of to-day any road work which tends to make that intercommunication more permanent and constant is of the army type, especially now that the country is committed definitely to the world war and intercommunication through motor is apt to become ever more important.

No one can question that there is as much to be said on the honor system, the humanitarian value, the economic worth and so on of prison labor on highways. Prison reform work really began with the application of prison labor to the public roads, and statistics gathered by the chief road engineer of North Carolina, A. D. Williams, for one, show that while from 8 to 33 per cent of the prisoners are convicted the second time, only from 2 to 8 per cent of those who were worked outdoors were second- or third-term convicts.

The point is that in view of these fragmentary constructions by convicts of permanent roads that will stand vehicular traffic, most of which was at lower cost than free labor would have caused, everything considered, why not enlarge the good work either through more extended use of the same labor or through more concentrated efforts on the part of all highway-making facilities. Almost invariably the roads that are constructed are of the permanent type, and some of the states specify macadam roads.

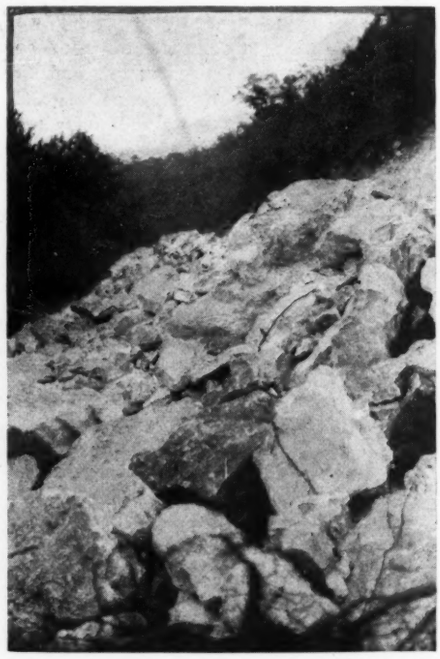
One of Montana's contributions to hard roads

Highways for Man's Devices

Unless your memory has served you very happily indeed you can recall the struggles with your Caesar in which you learned that conquering Romans turned their attention to road building, signs of which remain even to-day, or something to that effect. Permanent roads of indestructible hard surface made passage easy for the rumbling engines of marvelous construction used in besieging city walls, and the inaccessible country was made accessible through the power of the road armies that took the places of the army that destroyed while conquering.

There is no convict army to build and maintain permanent roads that give passage to these more modern devices of mankind, motor vehicles, and make the country accessible in every section reached by them. But the convict can give to the United States a larger army of fighters and farmers by taking the places of the road builders.

For two years the convicts of Colorado worked on the historic Santa Fe trail, and to-day the Skyline Drive is a boulevard that is the pride of the state and nation. They worked in small groups or camps, and were the first to work solely on honor, without guards and with guns only to keep stray animals away. During one season of construction the convicts built 6½ miles of permanent road, 4 miles of which was through rock. A camp that worked for four seasons in the open prairie country constructed permanent roads at a cost of



Blasting for roads in Missouri's convict experiment

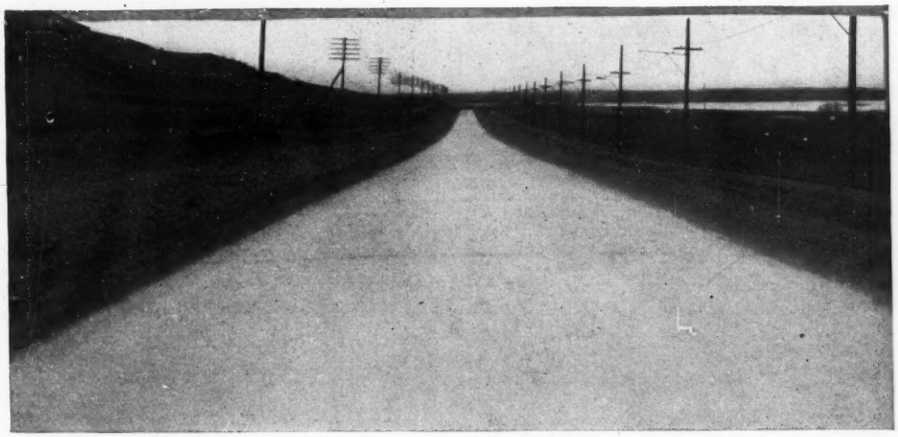
$1.50 a mile, including bridges and culverts. About 140 miles were built in one season. The value to the state was estimated at $210,000 and was obtained with a net saving of 50 per cent to the counties and the state. The state has used as many as 68 per cent of its convicts in road building and farming together during the last five years, and has 1000 miles as a result.

Montana now has an army of 150 convicts on road work in three crews. The state has been employing convicts for the last five years, and 50 miles of road were built in one county last year. Washington has been using the convicts on the Olympic highway—under the honor system, according to which each convict signs a pledge of honor that he will not leave the camp without special permission. Fifty cents a day is paid for the work, though the wages, except necessary incidentals and tobacco, are withheld until dismissal, unless all or part is given to the convict's family meanwhile.

Working Conditions on Olympic

The Olympic highway is on a steep mountain side just above high tide along the Hood's Canal, and working conditions were very unfavorable during the winter months. The average number of men in camp was 25, and 3.4 miles of road was opened to traffic, while 0.75 miles was constructed. Work was also done on the Pacific highway.

Convicts have worked continuously on Utah's state roads during the last two years. One county, Washington, owes practically all its state road work to convict labor. Before the establishment of road camps there the roads were in very bad condition. Motor travel was out of the question because of the extreme roughness of the rocky trails and the bad sandy stretches encountered in many places. There were bad washes and streams which needed culverts or bridges. In two years 23.4 miles were graded, 9.82 miles were surfaced, thirty-three stone and nine concrete culverts were constructed and two corrugated metal culverts were installed. A rock ford and retaining wall were built over a wash before famous for its bad condition. Extensive road work was necessary, and there were also sandy stretches to be mixed with clay and surfaced. This work was started in 1913, and nobody can longer say the roads of this county are unfit for motor travel, and therefore are not army-type roads.



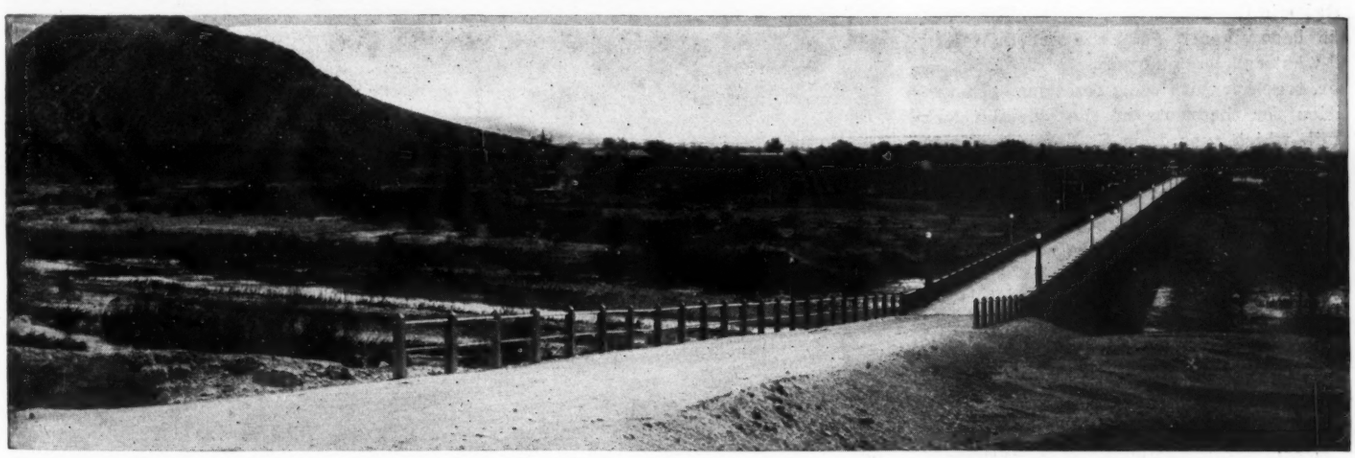
Utah convicts were factors in the construction of the country boulevard that is pictured here

Arizona, since 1913, has built 8.3 miles of roads and 1835 ft. of reinforced concrete bridges with convict labor. Two methods are used in the employment of prison labor, the honor camp of thirty-five or fifty men and a guarded camp of seventy-five or 100 men. Lately the number of convicts has decreased to such an extent, due to the prohibition law, the highway department says, that two camps will be too many. Some of the Arizona roads due partly at least to convicts' work are the Bisbee-Tombstone highway in Tombstone Canyon, and the Phoenix-Yuma and the Globe-Roosevelt highways.

"The California system is not based on any sob-sister theory of penology but is a sane expedient directed to the solving of our mountain road problem in California, which always has been beyond the resources of the state," writes the highway commissioner of the state of the excellent army-type roads. "We are trying to build by convict labor roads of a character and roads in locations which otherwise could not be contemplated at this time."

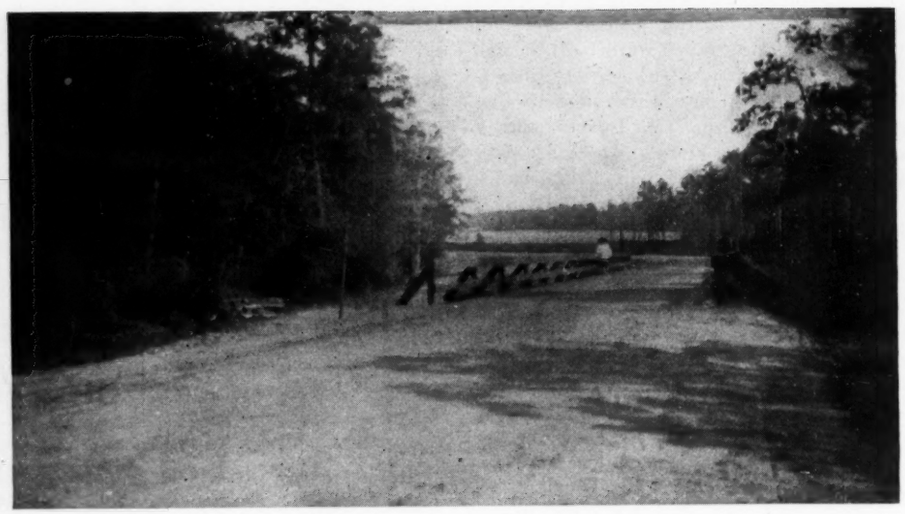
California has been using convict labor only since 1914. The first camps were established in September of that year and have been in operation ever since. The men are in sanitary, comfortable camps and are given all the personal freedom possible in return for a man's work every day. The law gives them one day's reduction in sentence for every two days of work. The guards are unarmed, the camps being on a modified honor basis, and the camps have been increased gradually from units of twenty-five to 100 men. Five additional camps have been working in the Sierras during the last year. The pioneer camps were in what is known as Rattlesnake Canyon in northwestern California, a very heavy and difficult 33-mile section through virgin wilderness. The engineer's net estimate for the 33-mile section varied from $346,000 to $365,000. It has cost $1.3459 a man a day with convict labor. Every item of expense has been charged, including $11,000 for equipment. It is expected that the link of the coast highway will be completed this summer after twenty months of convict labor at a cost of about $200,000. The link then will be open two years earlier than otherwise would have been possible.

Nebraska convicts saved the state $6,000 in building a mile long paved road in front of the state farm last year, besides earn-



Such roads and bridges as these examples are worthy of any army engineers' corps. They are convict built. The bridge is of reinforced concrete, 1509 ft. long, at Tempe, Ariz.

Big Creek bridge and road, Houston county, Alabama, before convicts' work



Big Creek bridge and road, Houston County, Alabama, after convicts' work. This is on the Dothan-Madrid road

ing from 50 to 75 cents a day for their work. They worked under the honor system, and only lost one man, a short termer. Wisconsin made its first experiment along this line a year ago on a 3-mile stretch between Waupun and Chester. Between twenty-five and thirty men were used, and a macadam road of about 3½ miles was constructed. During the last year two camps of fifteen men each have been working on roads in counties near Waupun.

Iowa Builds 50 Miles

Illinois has had six or seven road camps since the enactment of a law permitting convict labor to be used on public highways, which was in 1913. Michigan recently has completed a concrete road to the state reformatory at Ionia. Kent county has used several groups of from fifteen to twenty men without guard, except the superintendent. Iowa employs its convicts in the roads of the state institutions, of which there are 50 or more miles.

Oklahoma is building a road 35 miles long through the important towns of Pollatalomie County with convicts. The work has been undertaken as a demonstration of what can be done with state convict labor, together with costs for same. Competition for the route of the official Ozark trail, which runs from St. Louis to Santa Fe, N. M., is stimulating the use of prisoners on the roads, and about a dozen counties are using this labor now. In 1916 nine crews of 270 men, altogether, worked.

The East, with its older, more settled roads, also has made use of convict labor. New York still is experimenting with convict labor on roads, but during 1916 $50,000 was appropriated for the maintenance of convicts at work on roads. Localities in which the work was done contributed $20,000, and the expense of maintenance and repair, for which the prisoners were used for the first time, was paid out of the regular highway maintenance appropriation. About 500 convicts were employed on highways. Guards, about one to every fifteen convicts, were used. While no new roads were constructed the old roads were improved a great deal by lowering the grades, putting on road metal, blasting out rocks, widening cuts, perfecting drainage and so on.

New Jersey has employed between 105 and 150 men, averaging about 130. In addition to actual work on roads, the men have quarried the stone necessary. The roads built have been of macadam, to be dressed with bitumen, or gravel. Sussex, Salem and Essex Counties also use the convicts in road work. In Essex the men return to the penitentiary every night. They have a regular camp of the portable type in Salem. Sussex used only five or ten men, and these work with free labor and without guards, returning to the county jail at intervals, though not necessarily every night.

Massachusetts has used very little convict labor on the roads as yet, but one county, Worcester, has had a convict camp for the last three or four years, and has built several good roads on Mount Wachusett. A good deal of work is done on the state farm and at the prison camp and hospital. Connecticut used its first convict labor in the construction of state roads in 1915. A section of concrete road in Cheshire 3 miles long was built at a cost of about $30,000. Since then the convicts have built sections of macadam in Colebrook and are finishing a section of graded road in Mansfield. Since the use of convict labor on Delaware roads has been allowed, two sections of macadam road have been built, and plans are being made to enlarge the work.

Southern Seasons Are Longer

The South has had more success with the employment of convict labor on roads because the winters are mild enough to permit the work to be carried on through the winter in most sections. However, other factors arise, as in the North and West, to prevent the full use of convicts on roads. Louisiana, for instance, used them successfully in building roads from 1909 to 1911 and then had to withdraw them to build levees to protect the low-lying lands from floods. About 175 miles of improved

This road in New York State formerly was practically impassable during a large part of the year, vehicles miring up to the axle. Convicts changed it

highways have been constructed so far in Louisiana with convict labor. The saving has ranged from 40 to 60 per cent. About 12 miles were of gravel, while the rest were earth and sand-clay.

Alabama cannot work its convicts on the roads, but it can lease its convicts to the counties for road work. Some of the counties have been using convicts for ten years. The honor system is used only to the extent of making trusties of those whom the warden believes can be trusted. In Tennessee 400 convicts worked on the highways last year. With one exception, the roads were through mountainous sections. The honor system was used in one camp only. The 400 convicts worked about 96,000 days.

Georgia Requires Work

Under the Georgia law all able-bodied male convicts work on the public roads. They are distributed among the counties, according to population, the number in each county ranging from ten to 600 men. In the larger cities they build macadam and different kinds of tar-binder roads. In the rural districts they build sand-clay roads. The labor costs half as much as free labor. Georgia has about 80,000 miles of public roads, and last year 6000 convicts worked on about half of them.

About 2000 short-term convicts are working on the county roads of North Carolina. An act of 1914 provides their employment on the Hickory Nut Gap road, a link in the Charlotte-Asheville highway, and the Central highway in Madison County. The principal work done by convicts this far has been on the Central highway in Madison, McDowell and Buncome counties, and on the Hickory Nut Gap road.

The first experiment with convict labor in Missouri was made along the rocky bluffs, overlooking the Maries river in Osage County. The camp consisted of twenty-five men, and was made for three months. The commission has asked for funds to further the use of convict labor during 1917-18. Virginia has been using convicts on the roads since 1906. Last year the legislature appropriated $190,000 from the general funds, and fees will make this total $250,000. The camps vary in size from thirty-five to eighty-five men. At one time, in 1916, there were thirty-four camps employing between 1900 and 2000 convicts and jail men. In addition ten of the counties had a patrol maintenance system, the men for this work being paroled from the better class of prisoners to the maintenance department and used as patrolmen on maintenance work. These men are paid the regular monthly wages of the community in which they are working and are treated just as all free labor is treated.

The use of convict labor on the highways is increasing. A steady decrease since 1885 in the proportion employed under lease and contract has been accompanied by an increase in the proportion employed on highways and other public works. The problem of its use lies in the housing, clothing, feeding and general maintenance of a convict force.

Character of work done by California convicts. Much of the state's wonderful mountain road system is due, partly at least, to convict labor

Lack of sufficient funds with which to carry on the work of construction is the greatest obstacle in any good roads movement, and if this can be remedied by a system whereby the cost can be reduced to a minimum and the contractor's profit eliminated—as the commissions employing convict labor successfully say can be done in this way—the highest standards of permanent, motor vehicular roads may be lived up to yet.

Convict Roads Will Aid

The first outlays generally are the most expensive, as they are in any class of labor. Besides necessary implements and tools for handling earthwork, clearing right of way, building bridges and culverts, a certain amount of livestock is necessary.

The convict can be doing no better work than building roads, taking it from the standpoint of the country at present. A public road is a public necessity, and is becoming more so every day as the number of motor cars and motor trucks increases. The result of working convicts on the public roads will be a system of good roads throughout the states, a system such as this country yet may need either in preparing for or in pursuing its part in the great war.

The scarcity of labor at this time makes it especially desirous to employ the convicts on roads and leave free laborers for farm work or military duty. The national committee on prisons and prison labor has begun a movement for the mobilization of the convicts of the country in a national and state service for the building and upkeep of good roads. The American Automobile Association will aid by its good roads board, which includes a member from each one of the 600 odd clubs contained in the national body of car owners.

How California houses her wards while they are at the road camps. Convict labor is materializing roads otherwise impossible there

Limits 5 Per Cent Levy on Cars

House Amends Bill and May Discard Tax-at-Factory Plan

WASHINGTON, D. C., May 22—Special telegram—The House of Representatives, sitting in committee of the whole, amended the war revenue bill on motion of Representative Doremus of Michigan by limiting the 5 per cent levy on motor cars, motorcycles and their tires so that the tax would be effective only as to factories paying annual profits above $5,000 and 8 per cent on capital invested. This amendment was written into the bill by a vote of ninety-six to ninety-two after an effort to strike out the entire paragraph relating to a 5 per cent tax on motor cars, motorcycles and tires had failed.

It has developed that a proposition which was seriously discussed by the Ways and Means Committee of the House, but discarded on the advice of the attorney general that it would not be constitutional, to tax motor cars in the hands of individual owners on proportion to the horsepower, may be advanced in the Senate in lieu of the 5 per cent tax in the house bill. Senator Penrose of Pennsylvania, while not discussing in detail the changes which he will recommend and fight for in the revenue bill, stated emphatically when asked for an expression of opinion that this bill would be revised and practically rewritten in the senate. Mr. Penrose is ranking Republican member of the Senate Finance Committee. Opinion now is general that the senate will discard the 5 per cent tax at the factory plan.

A separate vote may be demanded in the fight in the house either to reject entirely or amend the 5 per cent tax section in the war revenue bill. The section in question has been to provide that there shall be deducted from the tax an amount equivalent to 5 per cent of the amount paid for the tires including inner tubes.

CREATES AIRCRAFT BOARD

Washington, D. C., May 21—An Aircraft Production Board has been created by the Council of National Defense. This marks the complete formulation of the government's aircraft policy and the beginning of the work of carrying it into effect. The general function of this board will be to bring manufacturers together and help make their resources available to the government and assist the government in stimulating the production of better types and greater quantities of air machines. Further, it will investigate and recommend manufacturers' plants where orders are to be placed, aid in arranging with factories as to the kinds of machines best suited to their facilities for manufacturing and following the selection of sites for aviation schools and supply depots, will advise in regard to buying or leasing the land, preparing it for use and erecting all buildings.

Following a visit to Toronto, Ont., by three technical instructors from the universities of California, Texas, Illinois and Ohio, Massachusetts Institute of Technology and Cornell University, these instructors are prepared to teach aviation, and six engineering schools have been opened in these respective institutions. These cadet schools might be described as laboratory courses in aviation. All applications from persons who wish to become military aviators have been turned over to General Squier's office over which Prof. Hiram Bingham of Yale has been given general direction, and there have been far more applicants than could be admitted. Twenty-five cadets a week are entering each of the six colleges, and it is estimated that there will be 600 cadets in the six colleges by July 1.

Wants 10,000 Cars

Bids Are Asked on Touring and Roadsters by July 8

WASHINGTON, D. C., May 19—That the War Department is expecting to order a great many passenger cars in addition to the truck order developed through the fact that all manufacturers of passenger cars have been asked to submit bids on both touring cars and roadsters in lots of 1 to 1,000. The War Department through the Quartermaster's Corps is negotiating with passenger car concerns for purchasing the cars. This is being done in anticipation of the final approval of the army special appropriation bill and contracts now tentatively made and will be perfected after bids are open for the new fiscal year beginning July 1 next.

Representatives of the Quartermaster's Corps are now visiting the various motor car plants to get a line on capacity of each and to ascertain what each can do when called upon, especially if called upon in an emergency. Inquiries now being made are on a basis of at least 10,000 cars to be promptly ordered. The bids to be opened will call for 40,000 cars to be furnished as asked for.

It is reported unofficially that 7000 passenger cars already have been ordered from three different concerns but this is not confirmed.

Wants Touring Cars and Roadsters

Chicago, May 22—According to the request sent out from Chicago, which is the headquarters of the central department of the Quartermaster's Corps, bids will be accepted only from manufacturers and not from agents or dealers. Bids are to be opened at 2 p. m. June 8 and then will be forwarded to Washington. Bids are asked on the following passenger cars:

1 to 1,000, five-passenger, $1,000 or under.
1 to 1,000, two-passenger, $1,000 or under.
1 to 1,000, touring cars, $1,500 or under.
1 to 100, touring cars, $2,000 or under.

No awards will be made under this opening of bids, but the offer and the prices are to remain open during the fiscal year, beginning July 1, 1917, purchases to be made by the Quartermaster's department from time to time as required. The cars are to be complete and the prices to be quoted f.o.b. factory. One of the points particularly asked is the time which will be required to ship the cars after the order is placed. The cars are to be inspected by the Government on delivery.

In addition, bids are asked for 70,000 trucks to conform to the new army standards, as follows:

1 to 35,000, Type A (1½-ton).
1 to 35,000, Type B (3-ton).

Bids for light delivery vehicles are asked as follows:

1 to 200, ½-ton capacity.
1 to 200, ¾-ton capacity.
1 to 200 1-ton capacity.

Motorcycle manufacturers are asked to bid on 10,000 motorcycles, half with sidecars.

POSTAL RATE TAX COMPROMISED

Washington, D. C., May 21—There already are indications that the Postoffice Department is ready to modify its proposal for a zone rate of postage on newspapers and magazines by accepting a flat rate compromise of 2 cents instead of 1 cent a pound. It has been estimated the zone rate proposed under the Postoffice Department's original plan would have averaged 4¾ cents for magazines. A new graduated second class mail zone rate proposal ranging from 1½ cents a pound in the first zone to 5 cents in the eighth has been considered by the committee. There will be a joint conference of representatives of business papers and members of the cabinet next Friday in Washington. President Wilson has let it be known to members of Congress in charge of the revenue bill that he does not favor the second class postage rate increase as embodied in the original bill.

All Set for June Derby

Five Consuls to Attend and 3000 Cadets to Storm Trenches

Mercer, Disbrow, Haynes and Hal Enter Dealers' Race

THE possibility that the Chicago motor derby June 16 will be the final speedway race of 1917, in view of the call for many of the drivers and mechanicians, who have volunteered for military service, to report at aviation schools and training camps for army chauffeurs in July, is a great incentive to the plans of the speedway management to make of the event a patriotic meeting in keeping with the times. Five nations will be represented at the derby through their consuls: Great Britain through Horace D. Nugent; France through Antonin Barthelmy; Italy through Count Giulio Bolognesi; Belgium through Dr. Cyrille Vermeren; and Russia through Antoine Valkoff. These men have been asked to serve on the executive committee which will distribute the war cause fund received from the military and motor events that day.

Dealers Have Entered

The non-professional race has aroused much interest. The first entry blanks were for two Mercers, a Disbrow Special, a Haynes and a Hal Twelve, and the entry of a Cadillac team and a Stutz team are expected, while others are considered probable. William A. Leet, Manning, Iowa, winner of last year's amateur race with a Mercer, has been invited to defend his laurels. Al Schillo, Chicago, who captured first in the 1916 dealers' event, has challenged F. D. Saupp, Pittsburgh, Pa., whose Peerless led at the end of the 112-mile for dealers at Uniontown recently. Andrew Ortmeyer, whose National car carried the colors of the Chicago Athletic Association in the amateur last year, has applied for leave of absence from the government aviation school he is attending to race his Mercer.

David F. Reid, president of the Speedway Park Association, is confident of as many starters as the classic a year ago, when Starter Fred J. Wagner sent away twenty-one cars. Entrants waiting to sign entry blanks include the Hudson company with Ralph Mulford and Ira Vail as drivers, Barney Oldfield, Earl Cooper, Eddie Hearne, Otto Henning, Ralph de Palma, J. C. Hoskins, who has engaged Dave Lewis to pilot his Deusenberg, and Billy Taylor, first at Uniontown May 10.

INDIANAPOLIS PLEASES PARIS

Paris, May 2—Although coming as a surprise, the decision of the Indianapolis Motor Speedway company to postpone racing until after the war meets with hearty approval in French motoring circles. There is a proposal afoot to induce the Automobile Club of France to take disciplinary measure against race drivers who have not fulfilled their military engagements or who have taken advantage of their legal situation to continue racing during the war. There is a precedent for this in the case of a racing cyclist who was free from military service owing to some slight physical defect and consequently took part in the New York six-day bicycle race. The body controlling bicycle racing in France considered that it was the duty of such a man to volunteer for service, and because he did not do so life disqualification was imposed.

NO 1917 RACING CHAMPION

New York, May 18—The contest board of the American Automobile Association has decided against holding the 1917 racing championship on account of the few speedways that will be active. It has allowed Aitken's 100-mile record of 56:37.65, made in his Peugeot at Sheepshead Bay Oct. 28, 1916. As a result of war conditions, the Oldfield dinner in Cincinnati has been postponed temporarily.

CHANDLER PRICES UP $200

Cleveland, Ohio, May 21—The Chandler Motor Car Co. will raise its prices $200 on June 30. On that date the seven-passenger touring car becomes $1,595; the four-passenger roadster becomes $1,595; the seven-passenger convertible sedan, $2,295; the four-passenger convertible coupe, $2,195; and the limousine, $2,895.

TO SOLVE TIRE PROBLEMS

New York, May 18—A tire manufacturers' division of the Rubber Association of America is to be organized. Representatives of about forty of the principal tire companies approved such a move at a meeting held yesterday. H. S. Firestone, president of the association, presided at the meeting, which also went on record in favor of adopting a standard contract clause covering fluctuations in the prices of tires. This clause provides that if the manufacturer finds it possible to reduce prices to the dealer, he will give the dealer the benefit of the reduction; similarly, if the manufacturer increases prices, the dealer is to have the choice of accepting the balance of unfilled contracts at the advanced price, or of cancelling the balance of the contract.

MORE RACERS FOR CINCINNATI

Cincinnati, Ohio, May 19—To date a total of thirty cars have been entered for the Decoration Day race at Cincinnati. In addition to those already named in MOTOR AGE, Barney Oldfield, Earl Cooper, Andy Burt, Dave Lewis, Louis Chevrolet, George Buzane, Otto Leisy, Jr., Billy Chandler and Eddie Rickenbacher have entered. Qualifications trials, at which a minimum speed of 90 m.p.h. must be made, will take place next Saturday.

Relay Run Reaches K. C.

Jefferson Highway Officials and Prominent Canadians Are Making Long Trip

Drive From Winnipeg to New Orleans on Rigorous Schedule

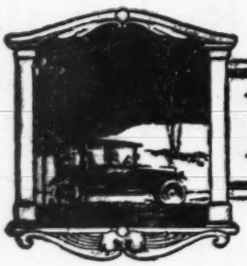
KANSAS CITY, Mo., May 21—Significance of the Jefferson highway, both nationally and internationally, as a military road of advantage was proven by the arrival here of the members of the relay-sociability run from Winnipeg, Man., to New Orleans. While the members of the party do not say that the highway now is in condition to bear heavy military traffic throughout its length, the possibilities of its use in an emergency are there, with the spirit and organization to carry out the task. Three cars, bearing officials of the road and public officials of the Dominion, left Winnipeg May 14 and have been joined by hundreds of cars along the way for a part of the trip. As the first official car reaches a town the speakers in that car make short addresses and when the next car approaches the first one leaves so that at times speeches are going on in two or three towns at one time.

Hon. T. C. Norris, premier of Manitoba, is the guest of honor on the trip. To every community through which the cars and party has passed the realization has come to the residents that the Jefferson highway is a road over which soldiers and supplies could be moved promptly in emergency. By keeping close to schedule officials of the highway believe they will demonstrate to the government the feasibility of making this road a military highway. The run will continue to New Orleans, and a return trip will be made in June.

GOODRICH ON 24-HR. SCHEDULE

Akron, Ohio, May 19—The B. F. Goodrich tire department is producing close to 30,000 tires a day. As a result this department is working on a 24-hr. day schedule. Continuous relays are run from Sunday midnight until midnight Saturday.

Earnings of the company are running about even with a year ago. For the twelve months ended Dec. 31, 1916, net was equal to $12.76 a share for the $60,000,000 common, after the preferred dividends, as compared with $17.17 a share in 1915, and $5.50 a share in 1914. Tire contracts with the car makers are running a little lower than last year. As a result the company is in a more fortunate position as regards taking care of its direct trade requirements, which are heavy, and then again, any contracts with makers at the lower prices are naturally burdensome just now. The expansion program has been completed, and there is little likelihood of any further heavy expenditures for plant additions for some time.



EDITORIAL PERSPECTIVES

Taxing Cars and Cosmetics

MOST illogical of the many illogical features of the motor car tax measure approved by the Ways and Means Committee of the House of Representatives is the fact that it is assumed to be collected only on luxuries, along with face paint, rouge, powder, etc. The members of that committee do not recognize the motor car as a necessity product and many of them refuse to be shaken in their opinion on this point.

NEW proposals are coming up each day regarding the 5 per cent tax and there can be no prophecy as to whether or how much it will be modified. The latest proposal—at this writing—is to limit the tax to concerns whose profits exceed 8 per cent a year.

ONE feature of the bill, hitherto undiscovered, is that as at present written, the 5 per cent tax also applies to cars in the hands of dealers for resale. This means that the cars that dealers have stored during the winter for summer sale would be taxed 5 per cent. In this way the bill would reach several months into past history and impose the 5 per cent tax on the foresight of dealers who bought cars for this summer's business.

THE bill also is so drawn that it might be stretched to cover used cars in the hands of dealers. If this were done, it would be tragedy itself, because the cars, as a general rule, represent to the dealers nothing except a loss and the 5 per cent tax would more than wipe out the profits of hundreds of dealers and distributers. Dealers' associations and individual dealers throughout the country are being urged to get in touch with their congressmen and tell them the damaging effect the passage of the bill will have on the motor car business.

IF the bill is passed, it will put many manufacturers out of business and if an effort is made to pass the tax along to the public through the dealer, the dealer will have to take it out of his profits or collect it from the car buyer. Any attempt to collect from the buyer of the car will obviously slow up sales, which are not very brisk as it is, and the net result will be a loss of such proportions that hundreds of dealers would suffer immeasurably if not being forced out of business entirely.

IN the Senate the arguments presented by representatives of the National Automobile Chamber of Commerce, by individual motor car manufacturers and by others interested in the industry to the Senate finance committee are said to have made a distinct impression. The feeling among members of this committee is said to be that motor car and accessory manufacturers will be bearing all of their fair share of the war burdens when they satisfy the income tax requirements, the excess profits tax, and place their entire resources at the disposal of the government in the making of cars, trucks, motors, or munitions of war, generally.

WISER ones among the law-making forces are realizing that the motor car industry occupies a position with respect to the national defense unique among the industries of the country. The war in Europe, and the expedition into Mexico by an American army, together with the operations of federal troops along the border all have made plain to the members of Congress, the army officers, and the laymen the vital need for keeping the motor car industry in this country at its best, and for encouraging it instead of putting obstacles in its way in the shape of legislation which would certainly prove destructive.

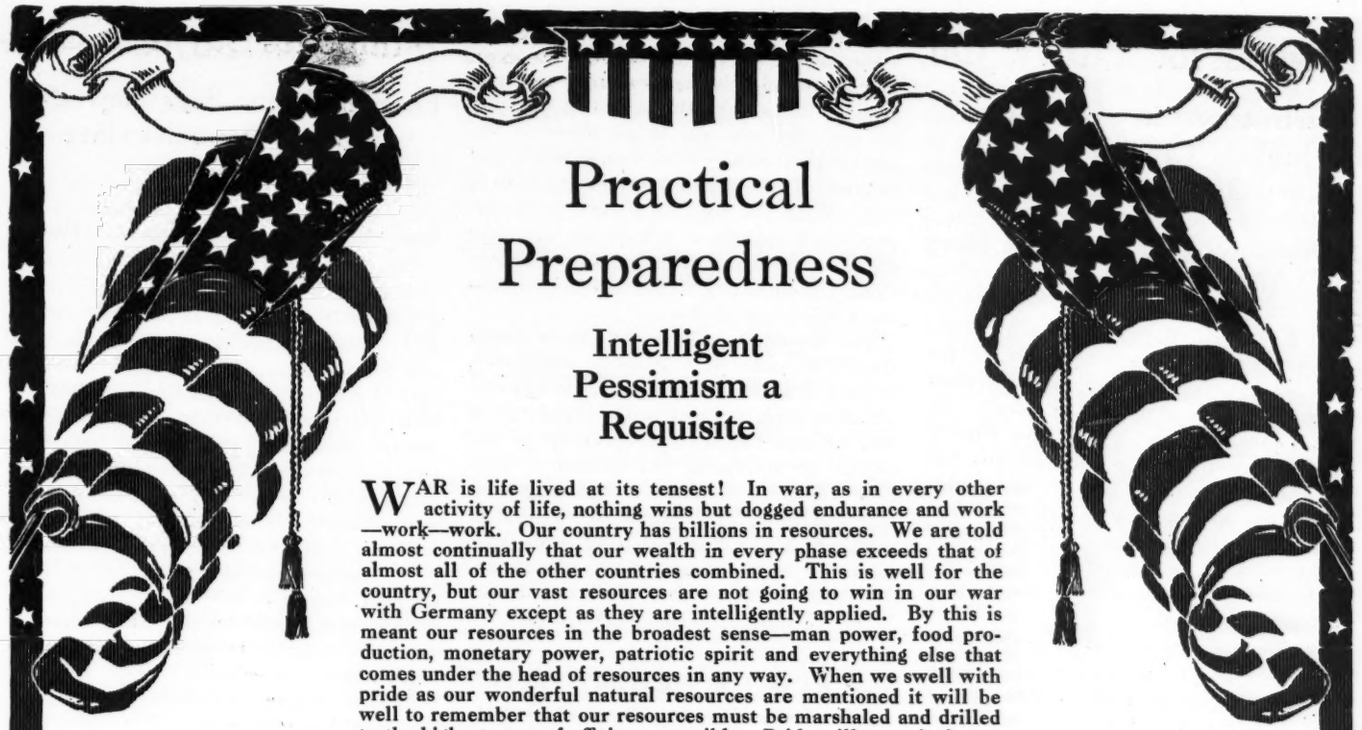
Army Staff Cars

UNTIL last week little has been known of what the Government intended to do in the utilization of the thousands of passenger cars America produces. With the call for bids from manufacturers of these vehicles, however, we get an inkling of the plans of the army. It is probable that these will be used for staff officers, etc.

THE present European war is essentially a motor war; motor apparatus is conveying the troops from point to point; motor ambulances have superseded horse ambulances; armored motor cars are operating in night raids, and in reconnoitering work; motor trucks are moving the heavy field artillery; motor apparatus is moving the huge field guns and siege guns; motor apparatus in the air is doing work impossible otherwise; in fact, the entire war is a motor war.

FRANCE found that army trained men who perhaps had never sat in a car till they went to the war drivers' school to be taught made better drivers eventually than the civilian drivers or those who had been civilians. England's bus operators, who were accustomed to working on schedule and had acquired the habit of strict discipline, were among the few civilian drivers who were a quick success.

IT has been said many times that the motor vehicle was the salvation of Paris, and this is true. By pressing into instant service every vehicle that could be obtained by organizing a transport over night practically, the German tide was turned almost at the city gates of Paris, but had Paris or the French army had the proper complete transport system in shape and in operation, in all probability Paris would never have had to be saved by such last-minute methods.



Practical Preparedness

Intelligent Pessimism a Requisite

WAR is life lived at its tensest! In war, as in every other activity of life, nothing wins but dogged endurance and work—work—work. Our country has billions in resources. We are told almost continually that our wealth in every phase exceeds that of almost all of the other countries combined. This is well for the country, but our vast resources are not going to win in our war with Germany except as they are intelligently applied. By this is meant our resources in the broadest sense—man power, food production, monetary power, patriotic spirit and everything else that comes under the head of resources in any way. When we swell with pride as our wonderful natural resources are mentioned it will be well to remember that our resources must be marshaled and drilled to the highest state of efficiency possible. Pride will not win for us the place that is ours in democrcay.

HOPES for success pinned to our resources without intelligent thought and mobilization of men and minds are no more valuable than our navy would be without officers or crew. We can and should find an example of what we must do in the statement made by Rear Admiral Bradley A. Fiske with reference to the navy. He says: "The highest type of mechanical science finds its expression in the ships of our navy * * * but the navy is not ships; it is men. Without men, our modern dreadnaughts are inert masses from which we may expect nothing." It is so with our enormous resources. Properly applied they can be made to win the war; left dormant they cannot bring us success.

THIS is a time for intelligent pessimism, for the kind of far-sighted vision that England did not develop until she had been in the war for a whole year. As was so frequently heard in England at the beginning of hostilities: "We know nothing about fighting and by the time we could train ourselves the war will be over," so we hear the same expression here. It is our hope that Germany will concede the rights of humanity soon. It is our hope that the war will be over within a few months. It is the prime thought in many minds that mere contemplation of our vast resources will discourage the enemy and that it will give up in despair. We shall do wisely if we put these hopes aside and enter the war, not as we have every other war with an expectation of the best, but enter with full preparation for the worst.

THE plaudits of Britain, France, Italy, Russia and Japan when we decided to enter the war was a sop to our pride. It was like a man who had no friends suddenly becoming popular. We liked the acclaim of course. Just in proportion as our preparations for active service drag along—as drag they always do under democracy—we are going to be criticised by our allies as England was criticized by hers. It will call for the utmost in statesmanship, hard work and patience to hold this big, unwieldy alliance together until the war is won. America should go into the fray as if she expected to win it single-handed. Foremost in our minds should be the thought that if Russia should make a separate peace, Mexico become antagonistic, or if the British should be weakened through the submarine menace we should gird ourselves now to see the thing through to a successful conclusion.

WE have only to look back, thumb the pages of American history, to find the disadvantages of unpreparedness. The American Revolution was the most haphazardly fought war in the history of the Christian era. Men were enlisted for periods of three months, six months or a year. They fought but a little while; then their service was completed and they went home at critical moments in the operations. The Revolution lasted seven years. In all nearly 400,000 men were enlisted to fight a British force of 150,000. Washington, at Valley Forge, could muster but 10,000 to 15,000. He complained much of the inefficiency that rendered his efforts futile. Only two engagements of the whole war were of real military advantage to us and the last and largest would have been utterly impossible had it not been for the French troops and fleet.

THE Battle of Blandensburg in the War of 1812 showed the inefficiency of our army. Fifteen hundred British troops defeated four times their number of American troops. Why? Because they were prepared and directed efficiently. Americans were sure of their success in this battle, but the dinner prepared for our victorious troops was eaten by the British and the next day they burned the capital.

VOLUNTEERS for the Civil War were called for ninety days. This was to be a three months' holiday with gold braid, honor and glory and a Thanksgiving dinner at home. It dragged along for four years, cost thousands of lives and thousands of dollars of property destruction that might have been saved had they prepared for a life-and-death struggle at the beginning. Some omnipotent power, such as opened the Red Sea and engulfed the Egyptians is not going to open the Atlantic Ocean and with a mighty sweep eradicate Germany's submarines for all time. We have the men, the money, the brains and the ability to win this war alone if we marshal all our talents and get the right perspective, but all our riches are not going to intimidate such a foe as Germany. This should be plain when she has so long weathered the storm of the world against her. To win we must fight and to fight efficiently we must be prepared and our preparedness should be of a high standard.

Engines for Heavy Oil

Construction in Germany of Junkers Gives 1 hp. for 3½ lb. Weight

Development Said to Promise More Than Kerosene Devices

NEW YORK, May 18—Passenger cars, motor trucks, and even airplanes, yet may be propelled by heavy-oil, high-compression engines such as the Diesel. In fact, a Junkers engine of this type already has been constructed in Germany and has given 1 hp. for every 3½ lb. of weight. This is the message which Henry G. Chatain of the General Electric Co. brought to the monthly meeting of the Metropolitan Section of the Society of Automotive Engineers last night.

Mr. Chatain stated that although present types of these engines are not suitable for road and air propulsion, there is no really inherent reason why an engine of this kind couid not be built and operated successfully. His paper was entitled "Treatment of Hydrocarbon Fuels" and was essentially an analysis of the manner in which heavy fuels are converted into energy in the cylinders of an internal combustion engine.

If such an engine is to be produced, Mr. Chatain pointed out, it will require that the basic principles underlying present types be studied, and carried out in the proper manner, and that a careful study be made of all mechanical parts and very likely that devices for converting the fuel into a gas be redesigned. Two of the things which will accelerate the development of these engines will be that they operate on ½ lb. of fuel per break horsepower hour and that the price of fuels is tending to increase.

Paper on Junkers Design

Philip Lane Scott had a paper on the design and construction of the Junkers engine. This is a Diesel type having two cylinders to each piston with the gas expanding between them and thus driving a three-throw crankshaft through suitable external connecting-rods or gearing.

Both Mr. Scott and Mr. Chatain seemed agreed that there are far greater possibilities in the development of a Diesel type or semi-Diesel type of engine for road and air propulsion than there is in the development of devices for the use of kerosene in the present engines or engines slightly modified to use this fuel.

With regard to alcohol, Mr. Chatain stated that we had not made any experiments with this fuel for the reason that there had been no wide demand for it. He stated further that, owing to existing laws which require that denatured alcohol remain in bonded warehouses for a considerable time, the small producer virtually is cut off from this market. Until these laws are amended it is entirely too expensive for small producers to turn waste material into alcohol. He offered as his opinion that the only way to use kerosene efficiently is to employ some device which will convert it into a fixed gas rather than a fog. With the fog, he stated, it is not possible to obtain a sufficiently complete degree of oxidization for efficient combustion; a good device would have to operate much like a gas producer.

The kerosene carbureter that is essentially the same as a gasoline carbureter, he said, is entirely inadequate, for the reason that applying heat in the manner it is now applied reduces the efficiency of the engine by decreasing the volume of mixture which is inspired. It was suggested that a more logical solution of the problem appeared in the distillation of crude at a somewhat higher temperature so as to utilize much of the content which now comes off in the form of commercial kerosene.

NEW RANK FOR MILITARY TRUCKS

New York, May 18—The War Department has granted the request of the standards committee of the Society of Automotive Engineers that it change the naming of the two military trucks, and hereafter the 1½-ton army truck will be known as military truck Class A and the 3-ton will be called military truck Class B. The change was desired because the trucks specified have to carry more than the nominal loads and are in every way heavier and larger than 1½- and 3-ton trucks should be built for commercial service.

COFFIN ON MUNITIONS BOARD

Washington, D. C., May 18—Howard E. Coffin has been named chairman of the industrial committee of the general munitions board created by the Council of National Defense.

SUPREME MOTORS CORP. FORMED

Cleveland, Ohio, May 18—The Supreme Motors Corp. has been incorporated for $1,000,000 to make three types of engines, a twin-six, a six and a four. It has absorbed the Davis-Mitchell Engineering Co., this city, which has been doing the experimental work. Courtney N. Mitchell is the designer. B. J. Cline, formerly with the Chandler and Elgin, has been made production manager. Experimental work is under C. E. Manning, for three years with the Continental Motor Co. The four-cylinder engine is for trucks and tractors, while the others are for passenger cars. The officers are: President and general manager, C. F. Jamison, formerly with the Saxon and Elgin; vice-president and treasurer, Charles H. Davies, organizer; vice-president and director of manufacturing, B. J. Cline; secretary, William J. Lavery; director of engineering and purchasing, C. N. Mitchell; assistant chief engineer, C. E. Manning.

Antipodes Buy U.S. Cars

Foreign Agent Says New Zealand and Australia Have 72,000 Cars

Era of Road Building to Boom American Sales

DENIED the product of the mother country, antipodal motorists, in fact and prospectives, are buying American cars in greater quantities than ever before. Now, these people show greater inclination toward American products than was true two months ago. Then they were buying of a neutral; to-day they are buying of an ally. This is the substance of a statement made to a MOTOR AGE representative by J. B. Clarkson, managing director of Hope Gibbons, Sons & J. B. Clarkson, Ltd., Wellington and Christchurch, New Zealand, who is in America to purchase motor cars, motorcycles, accessories and tractors, which his company distributes in New Zealand and Australia.

New Zealand and Australia have one car for each 100 persons, approximately, and the ratio is the same in each country. New Zealand with about 1,200,000 population has about 12,000 cars, while Australia with approximately 5,000,000 people has about 50,000 cars. Very few closed cars are found in New Zealand since the climate is mild and the winter season there consists of about four months of rainy weather.

Cars Cost More There

There has been a strong movement for better roads in this country in the last few years, especially since the motor car came into existence and now the island may be traversed from north to south with little difficulty, although there are sections of the "bush," as the New Zealand thicket is termed, that are almost impenetrable. Motorists of this country know nothing of the taxation placed on motor cars in America. Naturally they have to pay high for American cars—a Ford there sells for between $900 and $1,000 and the cars that we can buy in the United States in the $1,000 class cost approximately $2,000 in the antipodes. However, once a car is purchased, there is no further taxation. The high import duty and the high freight rates are looked upon by the commonwealth as sufficient for the motor car owner to pay. He gets a set of license plates for 60 cents and that number is carried indefinitely. No one pays taxes in New Zealand except land owners. Personal property tax is unknown.

Traffic congestion has not made itself felt in New Zealand. Mr. Clarkson says he never saw a car in his country equipped with a bumper. English-made cars come into New Zealand under a 10 per cent import duty, while American cars carry a 20 per cent tax. Since the war, of course, there has been no importation of English cars because their production ceased. Mr.

Clarkson says he now has orders for 1000 British cars for delivery as soon as possible after the war is over.

Some of the American car makers have their own branches in New Zealand, although there are a great many cars sold there by resident dealers. As might be expected, because of the high freight and import tax rate, our low-priced and medium-priced cars find the most ready market in New Zealand, consequently there are few of our more expensive cars to be found there. The cars of this class have come from European countries in the past, partly because of lower freight rates, partly because of lower import tax and partly because of the country's affiliations. There was a growing feeling against America and American products prior to the first of April, but now all this has changed, according to Mr. Clarkson.

Mr. Clarkson made the statement that with the era of road building coming strong in New Zealand and being conducted under scientific principles of engineering, he looks for sales of motor cars, especially American makes, to boom. Especially, he says, the tractor is finding its place in the fields. The country is chiefly a stock and grain raising country and there have been rapid strides toward mechanical tillage of the soil recently which presage almost universal use of the tractor within a few years in New Zealand.

OLDS IN BURGESSES CORPS

Lansing, Mich., May 17—R. E. Olds, president of the Reo Motor Car Co., has been elected a life member of the Burgesses Corps, to fill the vacancy caused by the death of former governor Curtis Guild, of New York. The Burgesses Corps is the oldest military organization in this country, and has honored many famous men, including rulers of other lands. It was organized originally in 1691 to defend the colonists at Albany, N. Y.

MECHANICAL ENGINEERS TO MEET

New York, May 19—The American Society of Mechanical Engineers will hold its spring meeting in Cincinnati, Ohio, May 21-24. Two important features of the meeting are the sessions on the manufacture of munitions and with the National Machine Tool Builders' Association.

A. A. A. MEETING MAY 25

New York, May 19—The executive board of the American Automobile Association will hold the annual meeting of the board of directors at the Hollendon Hotel at Cleveland, Ohio, May 25.

BIMEL PLANT SOLD

Sidney, Ohio, May 21—The American Motors Parts Co. of Indianapolis has purchased the stock, machinery, and so forth, excepting the finished cars, of the Bimel Automobile Co. of this city, at the Bimel auction sale. The American Motors Parts Co. bid $15,715.

New Bureau for Gibson

Accessory and Garage Engineering Experts to Aid Customers

Plans to Benefit Small Dealers' Business

INDIANAPOLIS, Ind., May 19—The Commercial Development Bureau of The Gibson Co., wholesale accessory distributor, recently launched with an invitation to customers of the company to avail themselves of knowledge possessed by engineering experts of the firm, on methods for improving business operations, is meeting with a hearty response from the trade.

Although the bureau has been in operation only a few months, it has received many applications for expert advice on various phases of the accessory and garage business. The results obtained in this brief time have convinced the company the average dealer is eager to place his business upon a sound basis—all he wants is to be shown how.

The plan adopted by the bureau is to supply to customers of the company without charge direct counsel on all subjects relating to the trade. If a man is just entering the business, the company will furnish him not only with detailed plans for erecting a building, arranging his stock and equipment but will provide a plan which may be adopted for the efficient transaction of the business itself.

Plan Aids Small Dealer

The plan reaches the small dealer who needs to be lifted out of the rut. His storeroom is unattractive, and all he needs is to follow out some definite plan of action for injecting real life into his enterprise. The work of the bureau is designed to be of help to the successful merchant who wants to expand, but who before enlarging his field of activities desires to have some plant that has been tried out by someone else with success.

The bureau is not dealing in generalities, but is giving direct counsel that will produce results if followed out. Each case is taken up individually, and an expert gives his time to working out a solution to each problem presented. If the storeroom is run-down, the expert shows how, through the use of wall-boards and panel effects that the storeroom can be converted at small expense into a place of business where customers will not have to offer any apology for visiting. Stocks are arranged in the most convenient and attractive fashion, still with the idea of economy of space in mind. The opportunities for window display are pointed out, and in fact every element entering into the make-up of a model shop is given consideration.

The bureau is endeavoring in each case where a garage plan is involved to devise a plan that will economize in time. This idea is applied in the location and operation of machinery. Each piece of equipment has its place. As an illustration:—the bureau holds that the air compressor should be driven by an independent motor. It is used more frequently than other machinery, and consequently with individual motive-power it can be operated more economically than if attached to a central line shaft, where other machinery would have to be operated each time the compressor is put into action.

The Gibson Co. is in its nineteenth year of operation, and the company simply is offering to the trade the wealth of information that has been acquired during this long period of existence. The company knows what to do and how to do it, and is willing to share the information with its customers. The real foundation for the inauguration of the bureau is that the success of the dealer means the success of The Gibson Co.

In addition to the development of its own plant in Indianapolis the company has aided in the construction of a number of privately owned stores in various localities. The company is to move shortly into a new $500,000 building which has been pronounced one of the best designed of its kind. Along with the bureau activities, the company publishes each month The Gibsonian, a dealers' organ, which has as its principal object the advancement of the trade.

MACON PLANT BURNS

St. Louis, Mo., May 21—The plant of the Macon Motor Car Co., Macon, Mo., was totally destroyed by fire Thursday morning. The loss is placed at $225,000. Friday the attorney for the company asked that a receiver be appointed. The assets listed in the application were: Uncollected insurance, $17,500; factory site, $2,500 and prospects of a suit against the Wabash railroad. The latter is due to the fact that the factory is alleged to have caught fire from burning railroad property, which is said to have been fired by a passing engine.

The Macon company expected to assemble a machine to cost about $1,000. None had been turned out, but the parts had been delivered to the plant, the machinery installed and the first machines were to be put on the market within a few weeks. The company was organized about a year ago and took over the plant and assets of the All-Steel Motor Car Co., but discarded the all-steel car idea.

MUNCIE STRIKERS AT WORK

Muncie, Ind., May 21—Striking workmen gradually are returning to work in the motor car and parts manufacturing plants, where 3000 machinists walked out two weeks ago when they were refused an 8-hr. day, a 20 per cent increase in wages, recognition of the union and time-and-a-half for overtime.

Some of the manufacturers met a part of the demands of the men. The plant of

the T. W. Warner Auto Parts Co. is in full operation, the men getting an increase of 25 per cent in wages, when they only asked for 20 per cent. Employees are returning to work at the plant of the Warner Gear Co., which is in partial operation, and about 50 per cent of the men have returned to work in the plant of the Muncie Gear Co., although the latter has refused to grant an increase in pay. Kenneth Spurgeon, manager of the Muncie Gear Co., said the company could not grant an increase in pay under present contracts as the men already were receiving higher pay than at other plants.

Strikers also are returning to work at the plant of the Inter-State Automobile Co., although the plant is still in a crippled condition. It is estimated that a total of about 1200 of the 3000 strikers have returned to work. The strikes have been conducted in an orderly manner.

TIRE WORKERS' STRIKE

East Palestine, Ohio, May 18—A strike at the plants of the McGraw Rubber Co., and the National Tire & Rubber Co., East Palestine, Ohio, caused both concerns to shut down indefinitely. The tire builders and vulcanizers demand higher wages and better working conditions. In all, about 1600 men are idle as a result of the strike.

DOWSE FORMS RUBBER COMPANY

Chicago, May 19—B. C. Dowse, until recently president and general manager of the Federal Rubber Co., Milwaukee, Wis., and his associates, have formed the Dowse Rubber Co., with an authorized capital of $2,500,000, of which $1,000,000 is 7 per cent cumulative preferred, and $1,500,000 common. A trade mark of "Dowse-Durability" has been adopted. The company already has plans for taking over a completely equipped plant in Chicago, Aug. 1.

40,000 Drivers Needed

France Lacks Experienced Men to Handle Trucks on Battle Front

Government Consumes Entire Output of Motor Cars

GRAND RAPIDS, Mich., May 18—Among the drivers of the 40,000 trucks on the French front, only 10,000 are handled by competent men. This is reported by George Sweet, vice-president of the United Motors Co., who has just returned from France. Trucks are transporting ammunition, supplies and soldiers and carrying large searchlights with dials 3 ft. in diameter to detect aircraft. The popular sizes are 3- and 5-ton. All except those carrying searchlights are equipped with bodies similar to that of the old prairie schooner. Many of them are mounted with the guns known as 75's.

All trucks are provided with folding seats to be used for either carrying soldiers or freight. The trucks back of the line are painted gray with green tarpons—in the front lines where the anti-aircraft and long-barreled guns are in use they are painted with blotches of yellow, green, brown and purple, so arranged as to make them look like foliage from the airplanes. Guns with 25-ft. barrels are carried on three trucks, and the barrels and trucks also are painted.

American trucks are holding up well. They are plentiful but not so numerous as the foreign make. The French truck factories have increased their production tremendously and now are turning out from 250 to 300 trucks a day.

The French government is consuming the entire output of its factories, and it is now a common sight to see officials driving Rollus-Royce limousines at terrific speed over the battlefields. There are very few American pleasure cars. Fords are in great numbers, and are being used considerably for ambulance purposes in the American service.

Probably the most noticeable change in the French passenger car, according to Mr. Sweet, is the rear dual pneumatic tire, with which all now are equipped, and the wire and disk wheels which are used entirely. The tires are studded, and 34 by 3½ is the most common size.

Nieuport Machines First

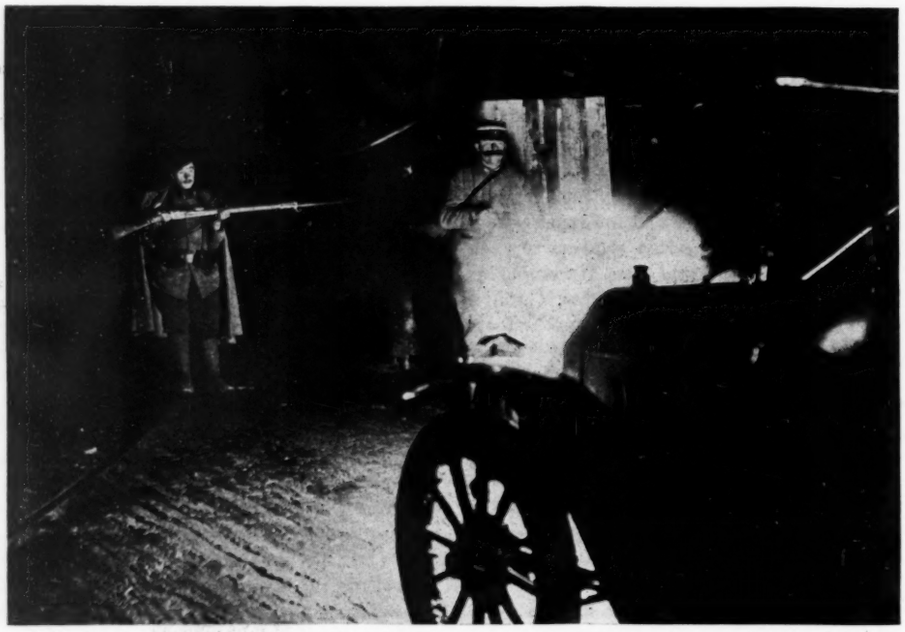
The Nieuport machine has been the leader, but this now is beginning to give way to the S.K.A.T. machine, a new airplane of the one-seat type only with an Hispano Suiza engine.

Nieuports are being made in one and two-seated style. The one-seater makes 150 m.p.h. and is known as the chasse machine. It is equipped with a rapid fire gun capable of shooting 500 shots a minute. When the aviators start on their flights they have but 500 rounds of ammunition with them, because when using the guns they are passing the enemy at a terrific rate of speed and can actually shoot but a few times at it.

The two-seated Nieuport is a fast observation machine, and has two of these guns. One is placed in the front of the driver and the other, which is adjustable, is over the driver for use by the observer. These airplanes are equipped with wireless of the receiving type only. They weigh 240 lb. and have a carrying capacity of 410 lb. The wireless is put on by means of a 4-in. strip of thin aluminum sheets, which are wrapped around the wing in the form of bands but are under the linen so that when the craft is in the air it is impossible for an observer to note the wireless attachment. These two-seaters are equipped with 9-cycle rotary engines, with a 220 hp., and are capable of 105 m.p.h. The observer has a glass plate in the bottom of his compartment and also a protected hole for dropping bombs and taking photographs.

Airplanes are common in Paris. They can always be seen or heard. Flights now are being made in all kinds of weather. The airplanes are aluminum gray in color with red, white and blue rudders. The one-seated Nieuport will run for 2 hr. and 45 min. The baby Nieuport runs for 2 hr. and 15 min. The life of one of these airplanes is 40 hr., after which it is turned in for complete overhauling.

Mr. Sweet believes that America can best learn aviation by sending its students to France. He believes that if the United States would pay the expenses of the students the French government would provide the teachers.



The French sentry calls "Halt! Who goes there" to the motor cars in the Vosges

STANDARDIZE TRUCK EQUIPMENT

Washington, D. C., May 19—Members of truck standard's committee of the S.A.E.

met here this week with representatives of truck factories of the Quartermaster's Department to work for standardizing various accessories that will be needed for military trucks. They considered such matters as front and rear bumpers, seat arrangements, towing hooks, large gasoline tanks, magneto straps and couplings, radiator guards, dust collectors for carbureters and generator mountings.

The Quartermaster's Department submitted general drawings showing the scheme of seat for military trucks which accommodates beneath it a 30-gal. gasoline tank as well as a tray for holding the battery. The seat accommodates four persons. Towing hooks will be required for four-wheel drive trucks which, it is understood, are the only ones that will draw trailers. For two-wheel trucks the front bumper is to be a heavy channel section backed by springs while the rear bumper may be a large ash or oak piece 56 in. long and 3 by 8 in. section. The radiator guard to be used is of European design and is the prison-bar grating type.

TO EXPLAIN SPARK PLUG MAKING

Indianapolis, Ind., May 19—The manufacture of spark plugs will be the subject of the evening at the next meeting of the Indiana Section of the Society of Automotive Engineers May 25. Albert Champion, general manager and vice-president of the Champion Ignition Co., Flint, Mich., will be the speaker.

GETS 227 NEW MEMBERS

Washington, D. C., May 19—Through the special membership campaign of the Society of Automotive Engineers conducted in April, 227 new members were enrolled. Of these, seventy entered into full membership, 110 as associate members, twenty-one as juniors and twenty-six as students. Several concerns have become affiliated members. The society proposes to publish a roll of honor of its members giving those enlisted in government service.

CLEVELAND SECTION MEETS

Cleveland, Ohio, May 19—At the May meeting of the Cleveland section, S.A.E. last night, J. H. Herron, consulting metallurgical engineer, spoke on "Some New Phases of Carbonization of Steel." He presented some curves which show variation of physical property with drawing temperatures, etc., and gave a table showing the percentage of softening for different drawing temperatures. According to the table, the maximum softening was reached when drawing back to a temperature of 1300 deg. F.

TO EXPORT 1150 OLYMPIANS

Pontiac, Mich., May 18—The Olympian Motors Co. has closed an export contract with Melchoir, Armstrong & Dessau, of New York City for 1150 cars.

A Hobo Hotel de Luxe

Tramps Ride With Shipment of Cars Across Continent at Vehicles' Expense

Headlights and Other Parts Pay Traveling Incidentals

THE tramps who rode halfway across the continent to Seattle, Wash., on the soft and luxurious upholstery of five Velie touring cars had no cause to envy their wealthier brethren passing by in the Pullmans while they were sidetracked. Their daily sustenance even had been provided for by the Velie factory, for the hobos, traveling de luxe, were able to dispose of enough of the removable parts of the Velies to buy the best of everything.

The shortage of freight cars has caused a great inconvenience to the dealers of Seattle and the Pacific Northwest. Because of it many Seattle dealers will not receive their full quota from the factories this year. Other dealers will receive most of their cars late in the season, after the great spring drive has been on for several weeks.

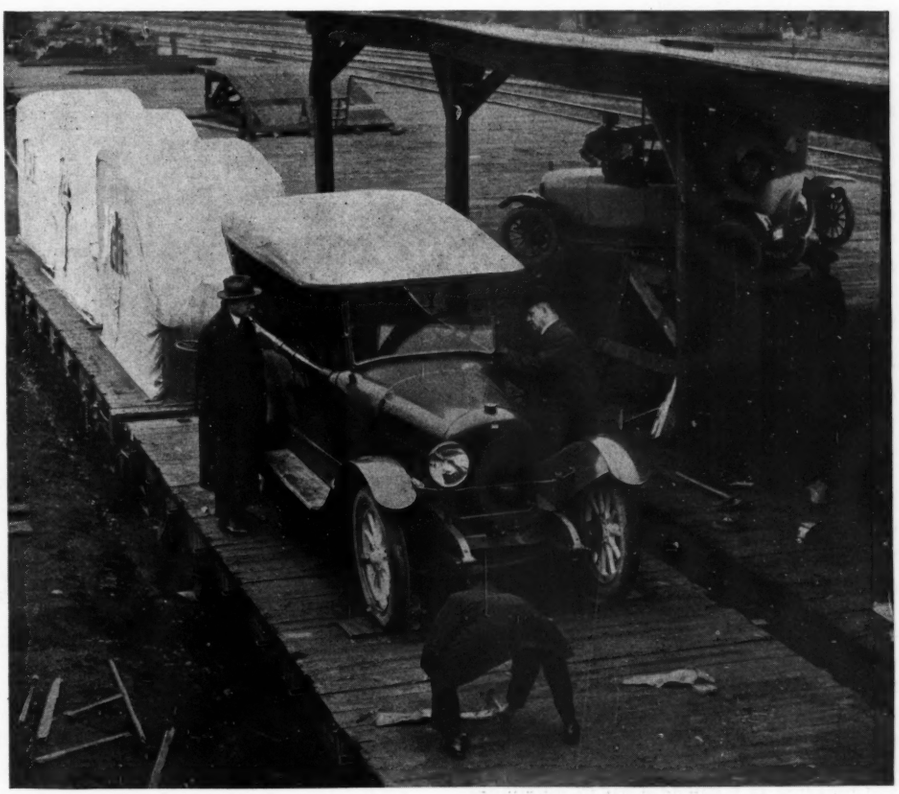
To get their cars which were needed with the arrival of the first bluebirds the Roesch Motor Car Co. of Seattle, Velie representative, ordered five touring cars sent through on flat cars, the only rolling stock available. The touring cars were blocked and covered with canvas tarpaulins. When the tarpaulins were removed in the freight yards the appearance of the touring cars told a story which probably is being repeated around many mulligan stews in the camps of the gentlemen of the road.

Slits in the tarpaulins showed where hobos had gone in and out. Dirty, greasy leather cushions showed where the hobos had slept. Crumbs and cigarette butts on the floor of the tonneaus told plainly of afternoon smokers. But the saddest sight of all greeted the dealers when they discovered that headlights, spotlights, speedometers, spark plugs, grease cups and almost everything movable had been stolen. Spotlights had been cut off with a knife, leaving the wires dangling in space.

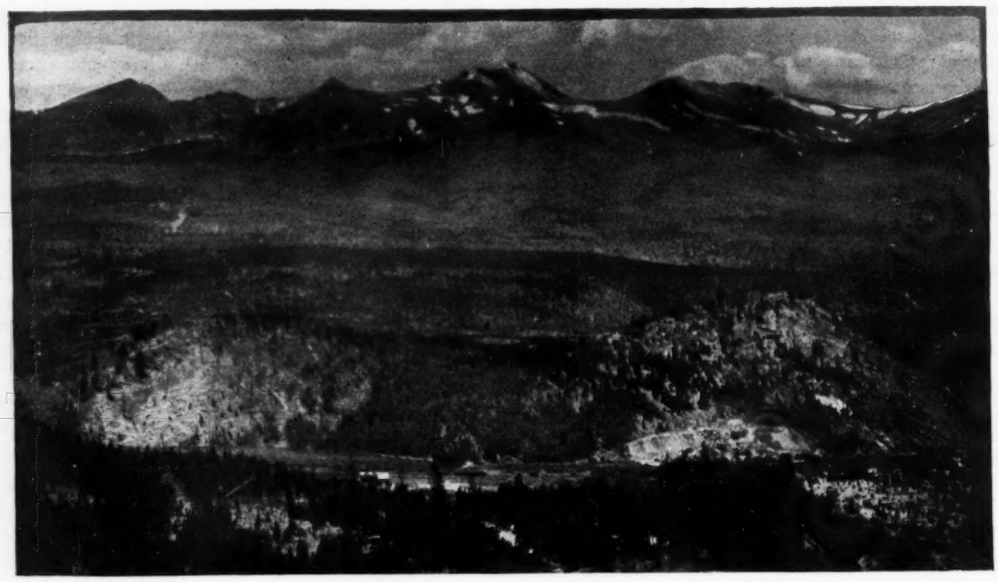
Never again on flat cars, say members of the Roesch firm, and other Seattle dealers who contemplated following suit have changed their minds and will wait until box cars are moving more freely.

DENVER GASOLINE JUMPS

Denver, Colo., May 18—The price of gasoline has jumped another cent in Denver after remaining steady four months. The wholesale price now is 23 cents to filling stations and garages, where it retails at 25 cents. Some garages charge 1 to 3 cents more, claiming that they sell gasoline merely as an accommodation and cannot afford to handle it at the filling station margin. The tank wagon price direct to consumers in lots of 25 gal. or more is 24 cents. There were two 1-cent advances in January, one on the 1st and the other the 18th. The only reason given by the big oil companies for the higher price is increased demand.



Claim agents checking up missing parts in Seattle after arrival of cars and tramps



They look close enough, but try walking. Even the trailer took some time to make the distance

Trailing a Trailer into the Rockies

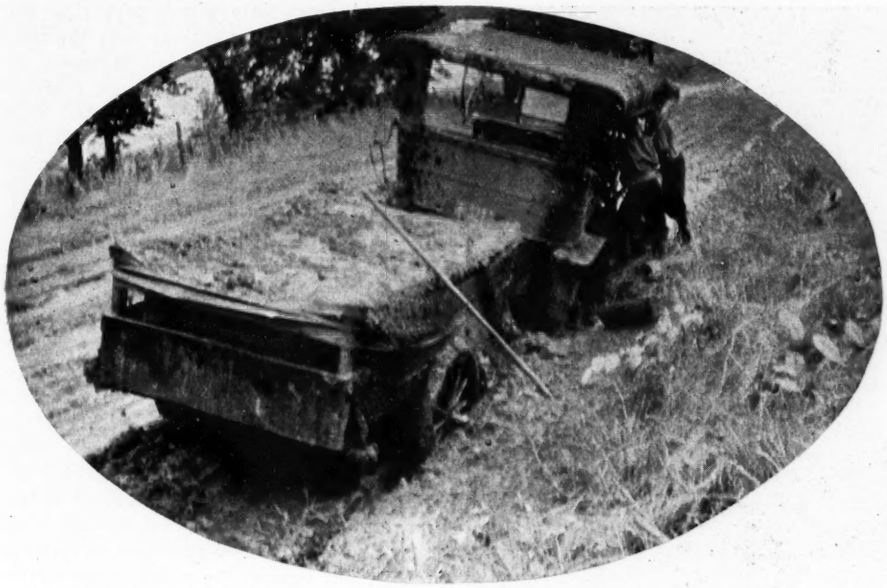
By W. A. LIPPMAN

In Three Parts—Part II

EXCEPT for the broken wheel bearing on our trailer, we fairly sailed across the plains of Kansas, following the splendid Santa Fe trail, a much better road than the Golden Belt highway, which is more direct in its passage from Kansas City to Denver, but through territory not as thickly settled. The Santa Fe trail is likewise much better between the Missouri line and the mountains than the Lincoln highway, which passes much farther to the north, coming through Wyoming and Nebraska. Our trailer was merely a following shadow as we sped over these smooth prairie roads. At times we traveled for hours at the highest speed we cared to travel, with no noticeable effort in pulling the trailer. That we traveled entirely without thought of the trailer is not to be imagined, for we found in this new plaything a constant source of surprise.

Normally the clearance afforded by the axle of the trailer is that of any large car; underneath the rear end of our trailer there had been constructed a storage box with a ground clearance of 12 in., apparently ample for all ordinary purposes. Now the usefulness of this storage box will be at once apparent to you, as it was to us. We filled it with a miscellaneous assortment of clutter. There were some four dozen cans of food, including tinned milk, which is a necessity in motor touring. My wife had invested in a splendid kit of aluminum utensils for the trip. These were well packed in the chest. My own personal belongings were represented in the shape of fishing tackle, including several costly reels with the usual foolish array of flies taken on such trips by one who would but cannot fly-fish. There may have been other what-nots in this ill-fated box—we never knew how much or how many—but suffice it to say that on one of these perfectly good smooth roads of Kansas, where for miles a stone is unheard of, we struck a sharp rock with the edge of the trailer store-closet and as we were afterward informed by friends in the car behind, we scattered cans, tackle, soap, pans, et cetera, for miles along the highway, reminiscent of nothing so much

The modern prairie schooner, Betsy Ann, set for the night. Note the storm curtains that the breeze is filling



This gives you some idea of the mud that may be flung on your trailer. A mud-proof covering is obligatory

perhaps as the trail marks of a frightened prairie schooner in Indian days. Our friends gathered what they saw as they sped along, finally developing a betting game as to the identity or character of what should turn up next. From the beginning of the sprinkling of supplies until our friends caught up with us was some 20 miles, and we had not known our loss.

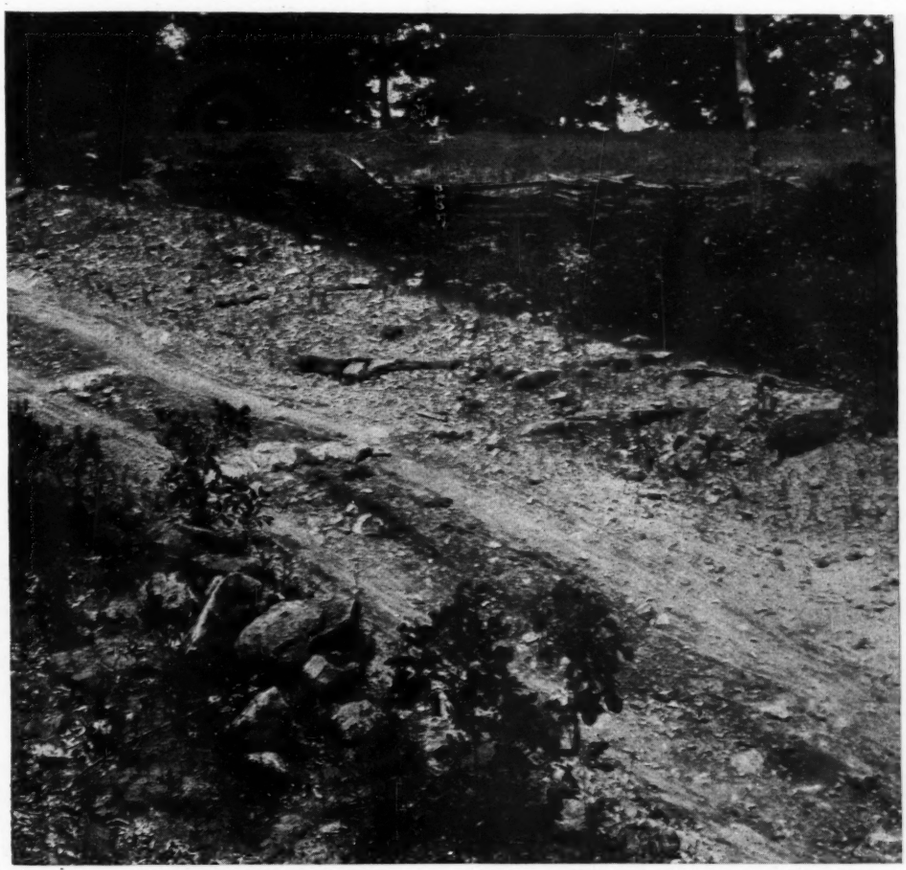
In the pleasant days along the old historic road our two parties, quite similar as to constituent members, sensed many of the problems of the earlier travelers. Nowadays, even in the Middle West, it is not always an easy matter to find an open space, unfenced and easy of access from the highway, where camp may be made, even with the simple requirements of the trailer. The fresh water factor always exists, but this is simplified in this day by the use of the desert water bags, and if one be fussy to extreme, there are always vacuum bottles which may be filled at the most convenient point and used as required. But the problem of water for cooking and camp use hardly can be solved in that manner. The water bag is a necessary blessing, and by using several we found ourselves very independent as to the location of our stopping places.

Tent Is Quicker

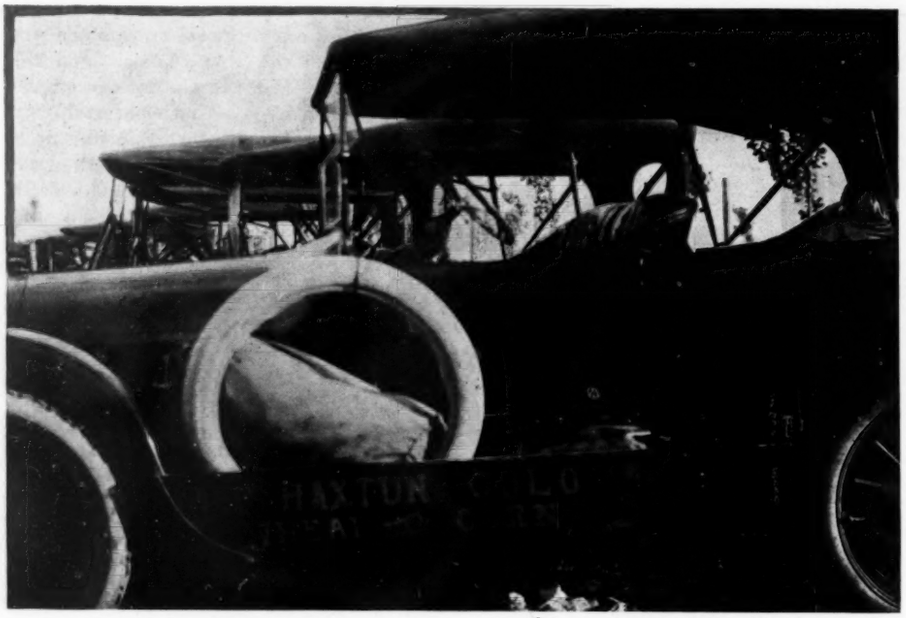
Having toured with camping outfits in previous years a word or two about the relative value of tent camping and trailer camping will not be amiss. Tenting is quicker for those who ask for nothing but a shelter, but for most motor tourists an unfloored tent is unpleasant and in damp weather impossible; moreover, there is the question of sleeping accommodations for a touring party. Tenting allows but two methods, the good old-fashioned method used by hardened campers of rolling up in a blanket on the ground and the modified but more cumbersome method of taking folding cots. Of course, there are sleeping bags and air mattresses and for that matter, regular mattresses as we have seen packed on behind Fords, but Heaven forbid! Few amateur tourists care to undergo the hardship of learning to sleep on the ground, and cots are not much better. A floor cloth machine-sewed all around the edge to the tent wall will keep out damp as well as insects and reptiles, but it is well nigh impossible to set up camp on wet ground even with this addition, and for many tourists it is absolutely out of the question to attempt living comfortably in a tent during wet weather. Setting up a tent camp, with cots and the ordinary paraphernalia, on previous trips would usually take from half an hour to a full hour, and a trailer can be set up ready for actual use in about half that time.

Trailer More Livable

As a place to live in while a semi-permanent camp stop is made, the trailer has many advantages over tenting. The distance from the ground removes the danger from ground damp—something that keeps many people from camping. This same feature also eliminates the worry over reptiles and insects. In this connection let me record the fact that in some 13,000 miles of country touring, covering five trips, we never have been annoyed by the snakes or lizards which are supposed to infest some parts of the west, but one accidental tent-camping in an ant-hill, due to pitching camp after dark, endears the trailer and its protection against such incidents. A trailer allows much greater freedom of action in selecting camping places, because it is not necessary to locate a smooth or level spot as in the case of a tent. Neither need you look for a large clear place or bother about roadside ditches and the like;



Rough-going for transcontinental cars, but not for long. Thank heaven, this section of the Mineola Hills road on the N. O. T. in Missouri is being overcome by a new route



One way of carrying equipment on a tour and another of boosting for your section

simply draw your trailer onto a wide spot in the road. Every road has some point where it is widened out. We seldom unhitched the trailer from the car. With nothing to do but pitch camp, nothing to loosen or open up on the car, the matter of opening the trailer top and swinging the beds out is a trick quickly done. The trailers on the market now, with few exceptions, are all built along similar lines, with the center of the trailer body clear after the beds are drawn to either side. This clear space in the center makes a cozy living-room, gives room for hand baggage in convenient reach and floor space for dressing, as well as a splendid place to set up the folding camp table for eating in bad weather or when the flies, mosquitoes or gnats make it impossible to eat outdoors.

Trailer Surprised Some

The appearance of a trailer, with its bungalow-like top, causes frequent surprises in out-of-the-way places, and we were treated to one of these one night as we camped in the triangle of a road "Y." We were late retiring, and after tucking the children in we had spent a few moments reading touring directions for the next day, our extension light serving nicely for this purpose. The side windows in our trailer canopy were cross-barred with canvas strips sewed through the mosquito netting for strength. At a short distance the light shining through these windows gives the canopy the appearance of a small house. We heard the small talk of two men passing in a buggy. As they drew near us they stopped, and one of them after drawing a deep breath, said: "I swear that house wasn't there when we came out tonight."

You may venture that the trailer breakdown interrupted and interfered with the enjoyment of the trip, but as a matter of fact they really did not mar the pleasure nearly as much as you might think. It always has been a part of our philosophy to accept these incidents as part of a trip, and that attitude of mind has been a saving factor on many an occasion, not only with us but with most tourists. The children, fortunately never have had any sense of risk or difficulty, and an instant after a stop for repairs or to contemplate the latest mishap they are out in the fields or prairie, woods or roadway, busy at games of their own.

Setting up camp with the trailer, the first step was to detach the dust cover, then raise the canopy top. The side bows dropped down into place, preparing the tent so that the bed springs with the mattresses and bed clothes, all strapped together, could be pulled out to position resting on the adjustable supports. This left the center of the trailer clear for personal luggage, part of which was carried on the floor of the trailer under the beds and the remainder laid on top of the tenting before the dust cover was pulled over it. The cooking utensils were carried in the rear of the trailer in a convenient place and taken out before even the canopy was raised, this giving my wife opportunity to start dinner on the folding gasoline stove with which our outfit was provided. I feel it a duty to remark that there is great room for improvement in the portable gasoline stove, of which there are several offered for sale now. I would suggest to the makers of these very useful devices that they pay a little more attention to making them proof against the rough usage which camp making and breaking is certain to give them. Also there should be more protection offered against the winds that are so frequently met with in the western country and which make it next to impossible to keep a fire going. If there is anything more aggravating than to have your fire go out just about the time that you have a batch of scrambled eggs half done, I know it not. Moreover, there must be a more generous provision made for the storage of gasoline. The filling valve also should be large enough so that you do not have to take half an hour to fill a quart tank, at that wasting more through spilling than you get into the tank. Since there must be a compression air pump to insure pressure, it should be an integral part of the tank system and not a separate pump; ours was the latter type, and we not only lost the rupper tip of the pump but once lost the pump itself in the tall grasses of the prairies. Aside from these few criticisms I have only praise to offer for the portable gasoline stove.

A certain feeding ground for trout the trailer found in the Rockies

Ready in Few Minutes

It is the work of a few minutes to finish preparing the trailer camp when you get as far as the setting up of the beds. As a matter of fact, comparing tent camping with cot beds, ground mats, air mattresses or any other form of camp sleeping arrangement with the trailer, there is a distinct advantage in favor of the trailer. Not only is this true so far as time is concerned but also the facility and ease with which things are found and placed where they belong. The trailer offers the opportunity for fastening things down in a substantial manner with fastenings which are adjustable, with the net result that when you wish to lay your hands on camp paraphernalia you may be certain to find them.

One of the things that always has bothered campers, especially when there are children in the party, is the question of where to hang clothing at night. That is taken care of well by tent pole clothes

hooks which fasten to the canopy bows or supports, each hook unit having four small and four large hooks. We have found them indispensable camp items. These may be obtained from any large camping supply house, such as Abercrombie & Fitch of New York or Von Lengerke & Antoine of Chicago. When the tent itself, tightly secured to the trailer body, is well closed in and provided with close mesh net window covers, with ample flaps in case of rain, there is nothing portable that is as comfortable as this trailer home, and I am ready to affirm that our trailer was as comfortable as the average summer cottage or bungalow. The very fact that you require only that nights shall be restful and have ample room for dressing makes the privilege of really living in the trailer during the daytime much more appreciated. On several occasions we camped in one location for nearly a week, and the trailer provided a real home that we never tired of, nor did we ever wish for large space. Our entire trip lasted seven weeks, and we never were so well satisfied with touring as at the end of this trip.

Parlor Car Misfits

Veritable monstrosities have been built under the guise of traveling palaces. Even if the cost of such special-built cars did not place them beyond the reach of all but the opulently rich, the appearance and cumbersome weight would serve to banish them. It will be many years before our roads, especially in the West and the unsettled portions of the North and South, will be fit to carry safely parlor car trucks weighing 3 or 4 tons, but there is absolutely no risk or danger attached to the trailer method of travel. Everything is in favor of distributing the weight of travel paraphernalia over the added wheelbase length which the trailer gives, and the passage of several tons of weight as, for instance, a medium weight car with a trailer attached will not endanger bridges or culverts. Trailer makers have very sound arguments in their favor when they call attention to the fact that a locomotive is capable of pulling a load of 100 cars, whereas it could not carry more than a few of them if the weight were loaded on top. The trailer of the future is certain to be linked with the increasing use of the motor vehicle as a means of commercial delivery. Already it has proved itself of great use in hundreds of various lines of business, and the time will come when our country roads will witness trains of trailers, drawn by a single motor, carrying monster loads of freight at rates that speedily will reduce the cost of first delivery and bring farm and city into close connection.

One of the most natural questions you will ask about the camping trailer, a question asked us at many points along the route of our 2600-mile trip, is in reference to the effect on the power of the car. There are many answers to that, chief among which is "I don't know," but observation

This road looks like dust, but it is slithery black mud

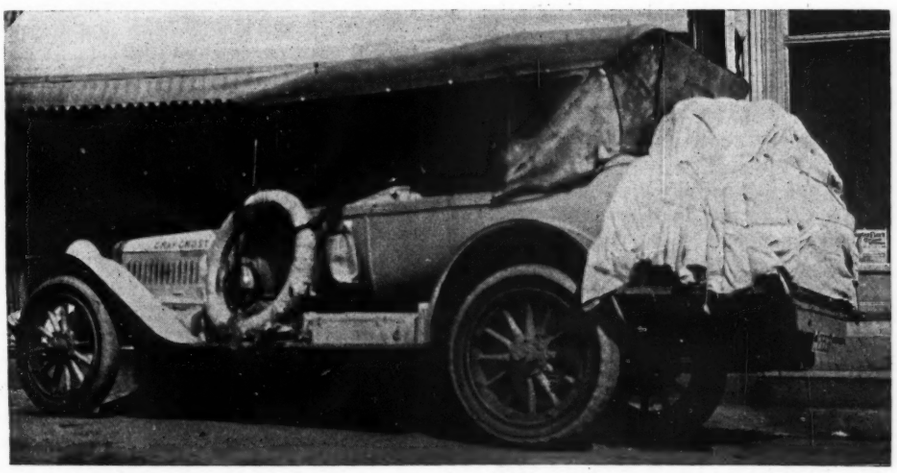
and a close study of the difference in handling the car with and without the trailer offer at least some basis for information on this subject. The first thought would be that the addition of 1000 lbs., more or less, on the end of the car would create a continuous burden without relief, except going down hills. As a matter of fact the presence of a trailer is noticeable only when starting the car and on extra heavy pulls, such as up very steep grades, through sand or mud. There is a certain shock effective at starting, since the load of the trailer must be picked up by the car something after the fashion of railroad coaches started through the link coupling ahead.

Some makers claim that a trailer should be attached with a spring coupling, on the theory that a spring on the coupling pole, acting like a pneumatic stop on a door, will absorb the shock of starting. Whether this is true or not is left to experts to determine. Others claim that a rigid type of fastening is correct, basing their claim on the theory that a rigid connection virtually acts to extend the car frame and thereby adds to its wheelbase the length of the trailer, and the elimination of starting shock is presumed to be obtained through this method rather than through the interposing of a spring. In either case the connection is flexible, of course, to allow for turning of corners and to compensate for different angles and grades, when the car might be tilted one way and the trailer another, or the car just starting out of a depression and the trailer just entering. Also this provides for the problem presented when the car passes over the crest of a hill, the trailer being on the other side.

Favors Rigid Fasteners

These varying conditions are met and overcome through any of the so-called ball and socket connectors or couplers and by many other arrangements, including plain clevis pins cast with free or moving ends, universal joints and several complicated contraptions all of which have various claims made for them as to their shock-absorbing properties and their provision for flexible handling. I am rather inclined to favor the rigid type of fastening, such as the ball and socket joint or a double clevis, made with a wide range of turning so there will be a minimum wear and strain. That is the type we used, and the results were very satisfying, both in the pulling and the effect on the powerplant of the car. Any of the connections are attached quickly and removed as easily, and once the car is under way, on first or second speed, it takes but an instant more than the ordinary time for the momentum to be sufficient to pass into high speed or direct drive, and after that the drag of the trailer is scarcely noticeable and the effect on the transmission of power will be detected more readily in the increased consumption of gasoline than in any other way.

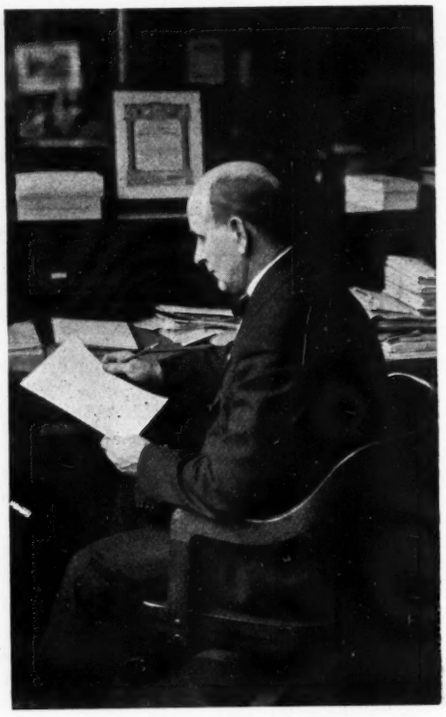
(Concluded next week)



The "gray ghost," enroute from San Diego to New York, had some weight on its back, didn't it?

The Brewster of Tiredom
Robert E. Lee

By Allen Sinsheimer



WHAT would you do with an employe you found stealing from you? Fire him? Lock him up? Here is a man who did discover an employe stealing — and raised his pay and promoted him.

He is a man who has the sole power to hire or fire any of the 11,000 workers under him; who began his industrial career with a 17-hr. workday, a wife and a $5 weekly wage; who has climbed the ladder of success, but lives on one of the lower rungs; to whom recently $1,000,000 was given to spend as he pleases for the benefit of his workers; and who finds himself, like the famous Brewster, undecided on how to do it.

His name sounds like that of a well-known civil war general, but there is no connection. The hero of the Confederacy was not related to the idol of Firestone workers—Robert E. Lee, superintendent of labor for the Firestone Tire & Rubber Co., and one of the best-liked bosses.

Looking at and listening to Mr. Lee you quickly learn his caliber. He is tall, powerfully built, genial, an electric riveter in thought, a piledriver in speech, positive and forcible in every word and deed. He knows 80 per cent of his workers by their first names. He passes his Sundays and holidays taking his family and the families of the Firestone employes for motor car drives. He devotes considerable time, thought and effort on an apple orchard and gives the ripened fruit to the youngsters of the city.

An Industrial Psychologist

The story of the thief who was promoted shows the man's keen understanding and sympathy and displays him to be a master of industrial psychology. Recently, a worker complained that his pay envelope was $10 short and denied that he had made an advance loan on his wages. Comparison of his handwriting and that on the advance loan voucher revealed that he spoke the truth. Someone else had used the worker's name and number dishonestly. After waiting quietly for several weeks, Mr. Lee called the employe to him and asked:

"Tom, has anyone questioned you about that $10?"

"The fellow at the next table asked me the other day what the company was doing about it," answered the rubber worker.

The superintendent sent for the individual who displayed such interest. Many questions resulted in a complete breakdown and confession. More revealed that the employe who was but 26 years old was married, had a family and a seriously ill wife. Investigation of his previous record showed him to be a good worker, prompt, speedy and efficient. Without more words, Mr. Lee promoted him and increased his wages from $17 to $22. Why?

"Pshaw, what was the use of doing anything else? I could not discharge the boy with a black record against him. He would be without work, and his family would have suffered. I could not threaten him with dismissal if he stole again. That would have made a sullen worker, minus loyalty, ambition and eagerness — which would be worse than no worker at all. No, I gave him better work and better pay—his record really entitled him to it—and now there is no more loyal nor efficient worker in the plant."

There, in a nutshell, is the deep understanding of the man. He did not allow revenge to sway him. He did not allow his superior position or authority to move him. Instead, he probed deeply into the human element of the situation, searching into the causes, the past record, the home conditions and, combining these with a keen knowledge of human nature, acted and talked to the offender in a manner he did not expect, and stimulated his honor and manhood and ambition.

Another incident that occurred not long ago shows how Mr. Lee handles his men. He was leaving the factory at noon and found two employees engaged in a loud quarrel on the street. He took them into his office. One owed the other 50 cents, and the creditor had taken it on himself to seize the debtor's coat until payment was made. The superintendent questioned the debtor:

"Do you owe him any money?"

"Sure, I owe him 50 cents, but I won't have it until payday and it is cold. I need my coat."

Mr. Lee turned, smiling, to the creditor.

"Well, John, this man is cold. He needs his coat. Will you give it to him?"

John refused to part with the coat until he received the money. Mr. Lee gave him the 50 cents. The debtor drew a pencil from his pocket and commenced to write an order on his wages for the amount.

"No," said his employer, "you can stop in here and pay me when you want to."

The workers left, each satisfied. A little thing—this matter of 50 cents—but the debtor was later overheard to remark that he "would fight for this company if they asked me to."

Mr. Lee frequently makes loans to the workers. Within the last three years he has loaned, without security, $30,000 to the different employes. More than $29,500 has been paid back, and he expects to receive the balance when the men can afford to pay it.

However, these are but small matters compared with many of the Firestone activities in which this superintendent of labor is involved, and many of which are the children of his own ingenuity. He manages the labor, the $350,000 Firestone clubhouse, the Firestone Park, where the employees purchase homes at cost, the insurance plan, the profit-sharing system and the employment department. All are under his direction and display in their methods and results the personality of the supervisor.

Effect on Labor Turnover

Five years ago Firestone was afflicted with every labor problem that confronts modern industry. There was an astounding labor turnover. The men who left the company's employ averaged between 20 and 30 per cent of the total organization every month. Absentees from work caused figures of 15 to 20 per cent monthly. Accidents injured 4 per cent of the entire force each thirty days. And the damage to machinery wrought by new and ignorant workers, the defect of product caused by masses of untrained and unskilled men, the accident compensation amounting to exorbitant figures and the cost of the employment department were problems much like those that most employers encounter now.

To-day the Firestone labor turnover shows a decrease of 18 per cent; accidents have reached a point where less than 0.08 per cent of the workers come to harm, and this despite an increase of more than 100 per cent in the number of employes. And

the remarkable record is attributable to Mr. Lee who:

Regulated the right to discharge workers.

Adopted a standard 8-hr. workday with the same wages as applied to the 9-hr. day.

Instituted a permanent day force.

Placed the newer workers in a night force.

Demanded 85 per cent glass in the factory walls.

Cared for the health of the employees.

Developed the Firestone Park for homes for workers.

Sold homes to the workers at cost.

Demanded the $350,000 clubhouse.

Aided the workers to purchase Firestone stock.

Not a Firestone man can be discharged without the authority of the superintendent of labor. There was a time, in the past, when every foreman had the power to hire and fire, and many workers were discharged because of petty spite, jealousy or anxiety to display authority. That appealed to Mr. Lee as an injustice. He took the authority of discharge from foremen and placed it with department managers. Here, too, he found the same evils. Men were discharged because of personal enmity and for other than justifiable reasons. Again, he moved the right of discharge. This time it was vested in just one man—himself—and to-day no one among the more than 11,000 Firestone factory employees can be discharged except by the superintendent of labor.

Wanted Contented Workers

Three years ago he turned his attention to the day and night shift plan by which Firestone workers operated. The men worked two weeks by day and then two weeks by night, which is about the same plan that most motor car and tire makers follow. The plan seemed to him to be injurious. He could not understand how a man who passed two weeks at night work and the following two weeks at day labor could be a healthy, happy and contented worker. Working by day and then changing to work by night, he felt, was certain to injure the worker's habits, produce restless sleep, harm the health, work discord in the home and ruin the ability for work.

He revolutionized the system. First, he adopted an 8-hr. day with the same wages as were paid for 9 hrs. of work. Second, he put a priority rule into effect which provided that the day shift was permanent and that as rapidly as there were vacancies in its those men who were longest with the company would be selected from the night shift. Once a man was made a member of the day shift he was assured that his transfer was permanent. The result was gratifying. It produced the wonderful decrease of labor turnover and vastly increased the contentment and productive capacity of the organization.

Five years ago Mr. Lee asked the officers for a clubhouse for the employees, explaining the need for a common meeting place where the men could mingle, bathe, play, read and become a body of friendly individuals. He had difficulty obtaining a swimming pool without the clubhouse. The idea was too new, and the employers struggling, then, with mechanical equipments and chemical formulas thought the human element was something apart from a factory.

Last year the company erected the clubhouse at a cost of $350,000—around the swimming pool. This year it voted to give Mr. Lee $1,000,000 to spend for the benefit of the workers as he sees fit. He is delighted with the opportunities the appropriation develops for him, and though he says that he "feels like Brewster and doesn't know just what to do with the money," he will no doubt find several means of spending it to the satisfaction of the Firestone officials and employees.

In addition to these features, Mr. Lee has supervised completely and promoted the plan whereby the employees are enabled to buy homes on a cost basis without an initial payment and to purchase the common stock of the company at prices far below the current market quotations by making small cash payments from their weekly earnings.

When asked why he believed he was successful, Mr. Lee said, "I merely set a goal to do as much good for others as I possibly could."

And he has—not only for employer, but also for employees. His reputation about the Firestone plant is summed up in a short description given by one of the men who said, "Whatever he does goes right." He has the ability and the energy and the eagerness to do things.

His Early Career

His industrial career began when he went to work as a sub-conductor for a Cincinnati street railway for $5.12 a week with working hours from 6 a.m. to 11.24 p.m. He was already married and says he does not care to recollect just how he and his wife managed to exist. It was but a short time, though, when he was made a conductor and received $12 a week steadily. From that position he graduated rapidly through the jobs of supervisor, gripcar driver, superintendent and, finally, general manager. Other cities then took notice of him, and flattering offers took him to the management of street railways in such localities as Baltimore, Md., and Washington, D. C., until the Firestone Tire & Rubber Co. called him to organize its industrial service department.

Mr. Lee was born at Baltimore in 1867. He is still a very young man. It is very likely that he will, with his ideals and energy, perform many more wonderful things in the industrial world, but it is improbable that he will ever be able to erect a more happy, efficient and loyal organization of workers than he has wrought at the Firestone plant. His success with men may be summed up briefly—he merely has been a very human being; a man who has a remarkable memory for names and can call his thousands of employes by their first names; who tries constantly to do good and calls justice good; who despite a remarkable success never forgets that he is merely a man and as he says it, "is only as good and no better than the most ignorant worker in the plant insofar as rights are concerned."

NOTABLES TO TALK TO S.A.E.

Washington, D. C., May 21—The summer meeting of the Society of Automobile Engineers, to be held June 25-26 in this city, gives promise of being a very important meeting, in spite of its being but two days. The meeting is going to serve to bring government officials at Washington together with the S.A.E. members, which is very important at this time. This means not only bringing engineers of the motorcar and truck industry together with the government, but also engineers connected with aviation, farm tractors and motorboats. The meeting will be the first big get-together of engineers representing all of these arms of the industry since the name of the society was changed from Society of Automobile Engineers to Society of Automotive Engineers.

That the government attaches considerable importance to the meeting is shown by the fact that Secretary of War Newton D. Baker has accepted an invitation to speak at the informal dinner at the New Willard Hotel, Tuesday evening, June 26. In addition C. B. Baker, head of the quartermaster's department of the army, also will talk. It was under his direction that the specifications for 1½ and 3-ton military trucks were arranged.

Wing Commander I. W. Sedden, R. N. A. S., who is a member of the British Commission in this country, and who is demonstrating some of the British types of war airplanes here, will present a paper dealing with airplane manufacture. Commander Sedden has had much practical experience on the Somme front.

Major Rees, also of the British Commission, and an experienced British aviator throughout the entire Somme campaign, will tell what airplanes of different types are actually called upon to do.

Motor trucks in the European war are being handled by W. Owen Thomas, consulting engineer of Detroit, and who for over two years was head of military motor transport work for the Canadian government and was on the French and British front for fourteen months.

H. L. Horning, of the Waukesha Motor Co., is preparing a practical paper on farm tractors.

The motor boat end of the S.A.E. will be represented by Henry R. Sutphen, vice-president of the Submarine Boat Corp., who will give an illustrated talk on standardization methods used and production plans in building the 500 submarine chasers which this country built for the British government.

Interesting Trips Out of Detroit

Motor Car Metropolis Offers Diversified Week-End Tours Over Good Roads

HISTORICALLY Detroit and southeastern Michigan are perhaps as interesting as any other American communities with the possible exception of Boston and Philadelphia. It was on the site of the city of Detroit that many of the interesting happenings in connection with the early history of America and the northwest territory occurred.

Though not many Americans realize it, Detroit is one of the few big cities of the United States that has been under three flags since the coming of the white man to America's shores. The French were first to settle on the site, Antoine de la Mothe Cadillac founding a French trading post and Fort Pontchartrain in 1701. Later the city passed into British hands and finally to the United States. It was captured by the British in the War of 1812, but was restored to the States at the war's conclusion.

Fort Gratiot

Port Huron, the site of old Fort Gratiot, is another interesting point. Other nearby towns and cities well worth visiting include Pontiac, Mount Clemens, Monroe, Flint, Ypsilanti and Ann Arbor. While the motor tourist seeks first of all beautiful scenery and good roads, he also enjoys visiting historical points. In these Detroit and vicinity abound. A drive along the Detroit river and Lake Saint Clair shores from Detroit to Mount Clemens or points beyond is enjoyable. Trips to the lake regions of Oakland county and Washtenaw county are also interesting.

Within a radius of ten miles of Pontiac there are twenty-five or more lakes, the shores of which are lined with summer cottages. Orchard, Pine, Cass and Walled lakes are among the principal bodies of water around Pontiac, in Oakland county. Good gravel roads and some concrete highways are to be found leading through the lake country. Another group of lakes are to be found north of Ann Arbor, Whitmore and Island lakes being the largest.

Several one-day trips out of Detroit can be arranged. One that is enjoyable is that to Mount Clemens, via the shore route through Grosse Pointe, the millionaires' colony of Detroit. This gives the tourist a chance to see Detroit's famous park, Belle Isle, and Waterworks Park, and to view the broad expanse of Lake Saint Clair. From Mount Clemens the route leads west through Utica to Pontiac and from the latter city south into Detroit, making a trip of approximately 100 miles.

Another one-day tour is from Detroit out Grand River avenue to Farmington, Novi, New Hudson and Brighton and from the latter town south to Island lake and Whitmore lake to Ann Arbor and from that city, where the University of Michigan is located, to Ypsilanti, Wayne and Dearborn. At Ypsilanti the state normal school can be seen, at Wayne the plants of the Harroun Motors Corp., and at Dearborn the country home of Henry Ford.

On this trip, at Island lake, will be seen the camp grounds of the Michigan State Spiritualist Association. On the Grand River road, between Novi and New Hudson, is located the site of the Kensington bank, the first wild cat bank in this section of the country. It was established in 1837.

The beauties of the Oakland county lake region can be seen on a trip from Detroit out Woodward avenue to Pontiac and west through that city on Orchard Lake avenue. Sylvan, Orchard and Cass lakes can be visited. Apple island, in Orchard lake, was the summer home of Chief Pontiac, who ruled supreme in the middle of the eighteenth century in the Michigan territory. Leaving Orchard lake, the tourist can turn south into Farmington, or continue west to Walled lake and from that point south to Novi, striking the Grand River road leading back to Detroit.

Tour Over Concrete Highways

A trip over concrete roads entirely within the borders of Wayne county, in which Detroit is located, can be made. The mileage is about 120. Go east on Jefferson avenue, passing the King, Chalmers, Hudson, Continental motor plants, through beautiful Grosse Pointe to the Seven-Mile road. Follow this concrete stretch westerly across Gratiot, Woodward and Grand River avenues to Northville. Go south from that town through Plymouth to Michigan avenue. Turn east to Wayne and south from that town through Romulus and New Boston, then following the Huron river shore to Flat Rock and Rockwood. Remain on the concrete past the latter town, finally turning left with the concrete, passing Grosse Ile, which is filled with summer homes, and then through Trenton, Wyandotte, Ford, Ecorse and River Rouge to Detroit. At Ecorse, the site of Emmons Park, is the point where Pontiac assembled his braves for the attack on Detroit in 1763.

About midway between Northville and Plymouth on this trip can be seen the remains of Mead's mills, where the first postoffice was established in Michigan in 1831. The foundry, woolen mill and grist mill built by Mead are still standing.

A shorter trip than this, approximately 60 miles in length, can be made out Michigan avenue to Wayne, thence south on the route previously described to Romulus and beyond. On this trip the tourist passes through Dearborn, where Henry Ford's country estate, previously mentioned, is located. Before approaching the town of Dearborn, the motorist passes a little white school house on the left side of the road. It was here the motor car wizard attended school when a boy.

Site of Dearborn Arsenal

Dearborn is also the site of Dearborn arsenal, from which the town takes its name. This arsenal was located on the old Michigan Pike, leading from Detroit to Fort Dearborn, now Chicago. The headquarters building of the arsenal was converted and is now used as the town hall of Dearborn. The powder magazine, turned into a double dwelling house, is still in use nearby.

The trip to Port Huron and intermediate points, which will take the best part of a day, is out Jefferson avenue, as described in the tour to Mount Clemens. About two miles from the city hall, on the right, is located the Michigan Stove Co. plant. In the yard of this firm were buried the dead in the battle of Bloody Run, fought with the Indians in the early days. A tablet marks the point. Bloody Run, a small stream, was destroyed when the city was built up to this point.

Leaving Mount Clemens, the route leads to New Baltimore, Fair Haven, Algonac, Marine City and Saint Clair. From New Baltimore on, most of the shores of Lake Saint Clair and the Saint Clair river are lined with summer cottages and hotels where accommodations may be secured. Harsen's and Dickinson's islands also abound with cottages and clubs. Below these are the famous Saint Clair Flats, filled with cottages and called by some the Venice of America. The Flats are observable only on a boat trip from Detroit to Port Huron, steamers making the trip both ways daily.

At Marine City and Saint Clair are located great salt wells. These are among the largest in the United States.

Another longer trip out of Detroit is to Flint, Mich., which rivals Toledo, Ohio, as the second motor car producing city of the world. It was at Flint that Indians in the early days obtained their flints. These were exchanged with tribes from distant

points for other articles, including buffalo skins from the western plains and pipestones from the community where Pipestone, Minn., is now located. The Buick, Chevrolet, Dort and other motor car factories are located in Flint.

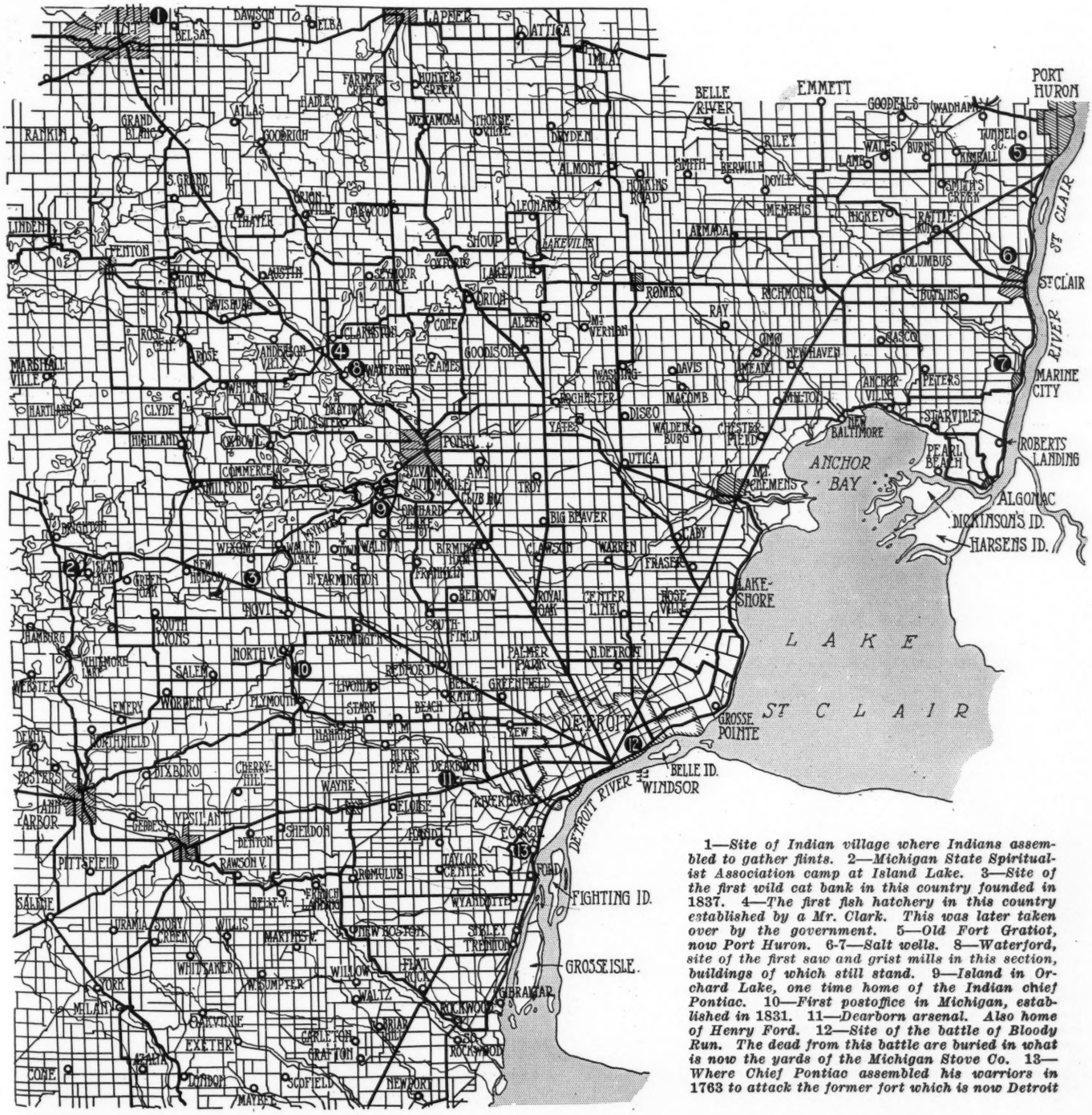
This route leads north on Woodward avenue from Detroit through Royal Oak and Birmingham to Pontiac. Between the two latter towns is Bloomfield Hills, where many wealthy Detroiters live. At Pontiac are to be found several motor car concerns, including the Oakland, General Motors Truck Co., Olympian, Monroe and others.

Going north from Pontiac the motorist strikes Waterford, where the first sawmill and grist mill in Michigan were located. These buildings still stand. The next town is Clarkston, where a Mr. Clark in the early days established a fish hatchery for trout. This was later taken over by the government. It was reputed to have been the first fish hatchery in the country.

Bad Stretch of Road

The road from the Wayne county line south of Detroit and just below Rockwood to Toledo has been known as the worst road in Michigan, if not in the United States. Contracts have been let and work has been started to pave this entire stretch this year. Tourists are not advised to go over this road, but in the event they do one spot of historic interest will be found near Monroe. It marks the place where the brave Kentucky troops in the War of 1812 were ambushed and massacred by the Indians who were acting as Great Britain's allies in the war. These Kentuckians were advised by expert woodsmen not to attempt to leave the fort at Monroe to go to the relief of those besieged at Detroit. They set out, however, but failed to reach their destination. It was on the banks of the River Raisin the massacre occurred in 1813. This event resulted in the long remembered cry of American troops: "Remember the River Raisin," when they were going into battle.

The postoffice building and other downtown structures in Detroit bear tablets marking points of historic interest. The visitor may find many such places in a walk about the downtown district. In



1—Site of Indian village where Indians assembled to gather flints. 2—Michigan State Spiritualist Association camp at Island Lake. 3—Site of the first wild cat bank in this country founded in 1837. 4—The first fish hatchery in this country established by a Mr. Clark. This was later taken over by the government. 5—Old Fort Gratiot, now Port Huron. 6-7—Salt wells. 8—Waterford, site of the first saw and grist mills in this section, buildings of which still stand. 9—Island in Orchard Lake, one time home of the Indian chief Pontiac. 10—First postoffice in Michigan, established in 1831. 11—Dearborn arsenal. Also home of Henry Ford. 12—Site of the battle of Bloody Run. The dead from this battle are buried in what is now the yards of the Michigan Stove Co. 13—Where Chief Pontiac assembled his warriors in 1763 to attack the former fort which is now Detroit

Capitol Square, on Griswold street, lies the body of Stevens Mason, first governor of Michigan. Aside from the historic things in Detroit and vicinity, there is much attractive scenery, mainly along the rivers and lakes making up a part of the Great Lakes system and the inland lakes of Oakland and Washtenaw counties and the Huron river.

Visitors in Detroit who desire more detailed information about trips around the city can secure specially prepared route guides at the touring bureau of the Detroit Automobile club in Hotel Pontchartrain.

Answers to Route Inquiries

Detroit, Mich.-Memphis, Tenn.

SENATOBIA, Miss.—Editor MOTOR AGE—Give the most direct route from Detroit to Memphis, Tenn.—Ernest McLendon.

From Detroit, Mich., proceed to Wyandotte, Rockwood Sta., Monroe, Toledo, Maumee, Waterville, Neapolis, Liberty Center, Napoleon, Defiance Junction, Antwerp, Woodburn, Ind., New Haven, Fort Wayne, Ind., Bluffton, Montpelier, Hartford City, Muncie, Yorktown, Daleville, Chesterfield, Anderson, Pendleton, Oaklandon, Brightwood, Indianapolis, Franklin, Taylorsville, Columbus, Seymour, Brownstown, Vallonia, Kossuth, Pekin, Borden, St. Joseph, New Albany, Louisville, Mt. Washington, Bardstown, New Haven, Athertonville, Hodgenville, Lincoln Farm, Buffalo, Hardyville, Bear Wallow, Cave City, Mammoth Cave, Cave City, Glasgow, Scottsville, Gallatin, Nashville, Bordeaux, Ashland City, Pardue, Bellburg, Charlotte, Dickson, McEwen, Waverly, Hustburg, Trotters Landing, Camden, Rosser, Huntingdon, Springcreek, Jackson, Huntersville, Harvey, Brownsville, Koko, Stanton, Mason, Gallaway, Arlington, Ellendale, Raleigh, Memphis.

Vols. 4 and 6 of the Automobile Blue Book, published by the Automobile Blue Book Publishing Co., 910 South Michigan avenue, Chicago, contain complete running directions for this trip.

Rapid City, S. D.—Stockton, Kan.

Owanka, S. D.—Editor MOTOR AGE—Give best auto route from Rapid City, S. D., to Stockton, Kan.—J. H. Borin.

From Rapid City, drive to Hermosa, Fairburn, Buffalo Gap, Hot Springs, Oelrich, Chadron, Alliance, Bridgeport, Sidney, Chappell, Big Spring, Julesburg, Sterling, Holyoke, Lamar, Imperial, Wauneta, Beverly, Culbertson, McCook, Indianola, Cambridge, south to Norton, Almena, Phillipsburg, south to Stockton.

El Dorado, Kan.—Detroit, Mich.

El Dorado, Kan.—Editor MOTOR AGE—Wish to drive from here to Michigan via St. Louis. How much hard surfaced road will I find in Missouri and Illinois and where?—F. L. Preston.

You omitted giving the point in Michigan you wish to reach so we have taken Detroit as our terminus. From El Dorado, drive to Florence, Elmdale, Cottonwood Falls, Emporia, Waverly, Williamsburg, Ottawa, Edgerton, Olathe, Lenexa, Overland Park, Waldo, Mo., Kansas City, Independence, Levasy, Wellington, Lexington, Waverly, Grand Pass, Marshall, Booneville, New Franklin, Rocheport, Columbia, Fulton, Warrenton, Wright City, Wentzville, St. Charles, Junction, St. Louis, Collinsville, Marysville, Edwardsville, Staunton, Mt. Olive, Litchfield, Hillsboro, Nokomis, Pana, Shelbyville, Windsor, Matoon, Charleston, Grandview, Paris, Terre Haute, Ind., Rockville, Marshall, Waveland, Linden, Elston, Lafayette, Americus, Deer Creek, Logansport, Rochester, Plymouth, South Bend, Elkhart, Middlebury, Howe, Orland, Kinderhook, Mich., Coldwater, Quincy, Allen, Jonesville, Moscow, Somerset, Clinton, Ypsilanti, Wayne, Dearborn, Detroit.

Good roads are in the majority over this route; hard surfaced roads are encountered in the stretch from Kansas City to Columbia, and from Terre Haute to Detroit.

Vols. 7 and 4 of the Automobile Blue Book published by the Automobile Blue Book Pub. Co., 910 S. Michigan Ave., Chicago, contain complete running directions for this trip.

Alexandria, La.-Hot Springs, Ark.

Angola, La.—Editor MOTOR AGE—Give routing from Alexandria, La., to Hot Springs, Ark.; also mileage.—G. W. Drehen.

From Alexandria, proceed to Pineville, Bentley, Montgomery, Clarence, Robilene, Belmont, Mansfield, Stonewall, Shreveport, Flournoy, Greenwood, Waskom, Tex., Marshall, Longview, Gladewater, Winona, Tyler, Edom, Canton, Wills Point, Elmo, Terrell, Forney, Mesquite, Dallas, McKinney, Anna, Whitewright, Bonham, Windom, Honey Grove, Brookston, Paris, Sylvan, Blossom, Detroit, Clarksville, Annana, DeKalb, New Boston, Texarkana, Fulton, Hope, Emmet, Prescott, Boughton, Gurdon, Arkadelphia, to Hot Springs.

Vol. 7 of the Automobile Blue Book, published by the Automobile Blue Book Pub. Co., 910 S. Michigan Ave., Chicago, contains complete running directions for this trip.

Indianapolis, Ind.-Greensboro, N. C.

Indianapolis, Ind.—Editor MOTOR AGE—Give route directions from here to Greensboro, N. C.—Joseph L. Stout.

From Indianapolis proceed to Rushville, Metamora, Brookville, Cedar Grove, Harrison, Cincinnati, Newport, Alexandria, Peach Grove, Caddo, Berlin, Brooksville, Maysville, Aberdeen, Bentonville, West Union, Otway, Henley, Portsmouth, Sciotoville, Ironton, Ashland, Ky., Catlettsburg, Kenova, W. Va., Huntington, Barboursville, Culloden, Hurricane, St. Albans, Spring Hill, Charleston, Marmet, Gauley Bridge, Ansted Sta., Rainelle, Lewisburg, Caldwell, White Sulphur Springs, Clifton Forge, Gala, Fincastle, Troutville, Roanoke, Rockymount, Martinsville, Ridgeway, Madison, Stokesville, Kernersville, Winston-Salem, Walkertown, Kernersville, Colfax, Greensboro.

Vols. 4 and 6 of the Automobile Blue Book, published by the Automobile Blue Book Publishing Co., 910 South Michigan avenue, Chicago, contain complete running directions for this trip.

Indianapolis, Ind.-Mobile, Ala.

Plymouth, Ind.—Editor MOTOR AGE—Advise best route from Indianapolis to Mobile, Ala.—George H. Cappel.

From Indianapolis proceed to Franklin, Taylorsville, Columbus, Seymour, Brownstown, Vallonia, Kossuth, Salem, Pekin, Borden, St. Joseph, New Albany, Louisville, Ky., Mt. Washington, Bardstown, New Haven, Athertonville, Hodgenville, Buffalo, Hardyville, Cave City, Mammoth Cave, Cave City, Glasgow, Scottsville, Gallatin, Nashville, Columbia, Mt. Pleasant, Rockdale, Leoma, Florence, Sheffield, Russellville, Hackleburg, Hamilton, Guin, Vernon, Columbus, Miss., Brookville, Macon, De Kalb, Daleville, Meridian, Cuba, Ala., York, Livingston, Coatopa, Demopolis, Faunsdale, Uniontown, Bialock, Safford, Orrville, Hazen, Beloit, Selma, Beloit, Hazen, Orrville, Cafford, Alberta, Catherine, Lamison, Pine Hill, Sunny South, Thomasville, Fulton, Grove Hill, Jackson, Leroy, McIntosh, Malcolm, Calvert, Chastang, Mobile.

Vols. 4 and 6 of the Automobile Blue Book, published by the Automobile Blue Book Publishing Co., 910 South Michigan avenue, contain complete running directions for this trip.

Michigan City, Ind.-St. Louis, Mo.

Michigan City, Ind.—Give routing from here to St. Louis.—E. G. Sperry.

From Michigan City proceed to La Porte, Westville, Valparaiso, Merrillville, Dyer, Frankport, Ill., New Lenox, Joliet, Elwood, Wilmington, Braceville, Odell, Pontiac, Chenoa, Lexington, Towanda, Bloomington, Lincoln, Elkhart, Williamsville, Springfield, Litchfield, Mt. Olive, Staunton, Edwardsville, Maryville, Collinsville, East St. Louis, St. Louis, Mo.

Vol. 5 of the Automobile Blue Book, published by the Automobile Blue Book Publishing Co., 910 South Michigan avenue, Chicago, contains complete running directions for this trip.

Chicago-West Baden, Ind.

Chicago—Editor MOTOR AGE—Advise best route from here to West Baden Springs, Ind.—L. M. Goldberg.

From Chicago proceed to Dyer, Kreitzburg, Brunswick, Hanover Center, Lowell, Schneider, Lake Village, Moroeco, Ade, Goodland, Remington, Wolcott, Lafayette, Frankfort, Antioch, Lebanon, Royalton, Flackville, Indianapolis, Columbus, Sweet Ireland, Waymansville, Spraytown, Freetown, Bedford, Mitchell, Orleans, Paoli, Prospect Corners to West Baden.

Vol. 4 of the Automobile Blue Book, published by the Automobile Blue Book Publishing Co., 910 South Michigan avenue, Chicago, contains complete running directions for this trip.

Eldora, Ia.—Denver—Rupert, Ida.

Eldora, Iowa—Editor MOTOR AGE—Outline a route from here to Rupert, Ida., traversing Denver and Salt Lake City.—E. T. Lundy.

From Eldora, Iowa, proceed to Marshalltown, Ames, Boone, Ogden, Grand Junction, Jefferson, Glidden, Carroll, Denison, Marion, Dow City, Dunlap, Woodbine, Logan, Missouri Valley, Council Bluffs, Omaha, Elkhorn, Waterloo, Ames, Richland, Columbus, Duncan, Central City, Chapman, Grand Island, Alda, Shelton, Kearney, Elm Creek, Lexington, Cozad, Gothenberg, North Platte, Sutherland, Paxton, Ogallala, Bigspring, Chappell, Sidney, Kimball, Bushnell, Pine Bluff, Cheyenne, Greeley, Denver, LaPorte, Tide Siding, Laramie, Rock River, Carbon, Evansville, Hanna, Fort Steel, Rawlins, Wamsutter, Rock Springs, Green River, Lyman, Fort Bridger, Evanston, Main Forks, Wanship, Salt Lake City, Ogden, Brigham, Wellsville, Franklin, Ida., Whitney, Preston, Clifton, Good Valley, McCammon, Inkom, Pocatello, west to Rupert.

Vol. 7 of the Automobile Blue Book published by the Automobile Blue Book Pub. Co., 910 S. Michigan Ave., Chicago, contains complete running directions for this trip.

Greenview, Ill.-Henderson, Ky.

Greenview, Ill.—Editor MOTOR AGE—Give a route from here to Henderson, Ky.—Guy L. Swiney.

From Greenview, proceed to Springeld, Taylorville, Assumption, Shelbyville, Stewardson, Effingham, Dietrich, Wheeler, Newton, Olney, Vincennes, White River Ferry, Hazleton, Patoka, Princeton, Fort Branch, Haubstadt, Stringtown, Evansville, Howell, Ohio River Ferry, to Henderson.

America's Two Busiest Corners

At the left is shown the intersection of State and Madison streets, Chicago, admittedly the busiest four corners in Chicago and the Middle West. Below is Fifth avenue and Forty-second street, New York, characterized as the busiest corner in the world. A survey of these two illustrations shows how little attention pedestrians pay to traffic signals. Where vehicular traffic has the right of way it is plain that the pedestrian ignores this right and takes his life in his hands to save a few moments' time.

Electrical Equipment of the Motor Car

By David Penn Moreton & Darwin S. Hatch.

Editor's Note—Herewith is presented the forty-fourth installment of a weekly series of articles begun in MOTOR AGE *issue of June 29 designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the Class Journal Co., Chicago, in a size to fit the pocket conveniently.*

Part XLIV—Switches and Protective Devices

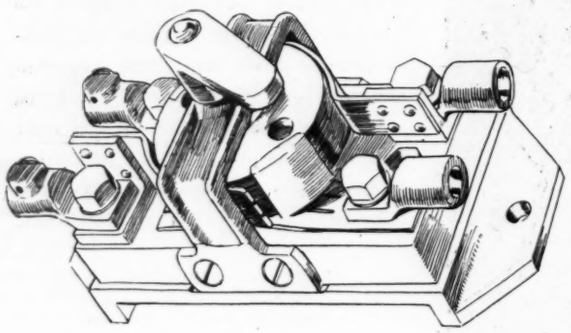


Fig. 252—The rotating, or drum, switch, used by the Leece-Neville Co.

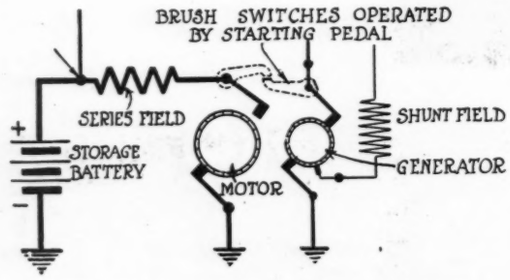


Fig. 256—Diagram of brush switch used in the Delco systems

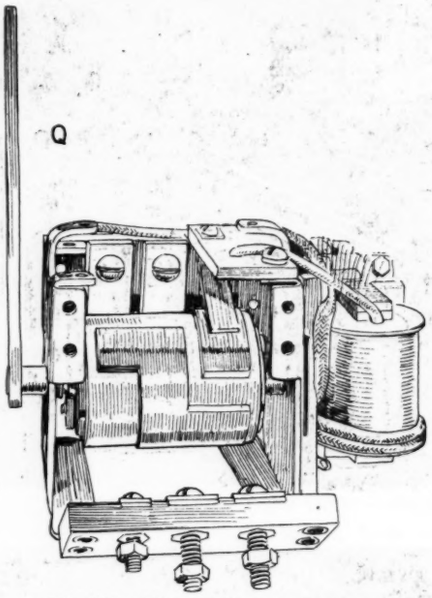


Fig. 253—The rotating, or drum, switch used by the Wagner Electric Co.

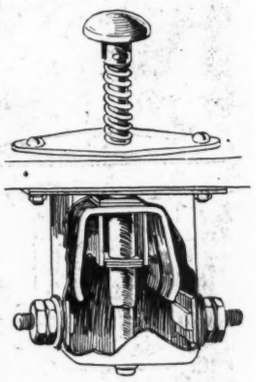


Fig. 255—Example of thrust type of switch in which an end or thrust movement performs the operation

A ROTATING, or drum, switch, is one in which the switching eration is accomplished by a rotating member. Two good examples of switches of this kind are shown in Figs. 252 and 253. The switch shown in Fig. 252 is one used by the Leece-Neville Co. in the starting motor circuit shown diagrammatically in Fig. 249. The switch shown in Fig. 253 is made by the Wagner Electric Mfg. Co. An exploded view of this switch is shown in Fig. 254.

The switching operation in the case of a sliding switch is accomplished by moving a set of contacts so they complete a circuit between fixed contacts.

In certain types of switches, which might be called thrust switches, the switching operation is performed by an end or thrust movement of some part of the switch. A good example of a switch of this particular type is shown in Fig. 255, and its operation is quite simple. The switch normally is held open by the coiled spring, but when sufficient pressure is brought to bear on the button or pedal, the contacts may be brought into contact with each other, and will remain in contact until the pressure on the pedal is removed. The action of the spring then will open the switch.

A brush switch is one in which the switching operation is performed by raising and lowering one of the brushes on the machine. A starting switch of this kind, as used on the Delco systems, is shown in Fig. 256. Depressing the starting pedal lowers the motor brush and at the same time makes the generator end of the machine inoperative by raising one of the generator brushes.

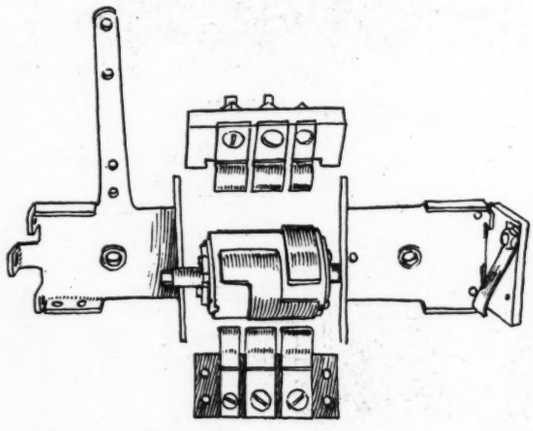


Fig. 254—Exploded view of drum switch used by Wagner Electric Co.

From the Woman's Viewpoint

The Long Handle The Emancipator

ON first thought no one would call the long-handled jack which enables the motorist to work under without getting under an emancipator. But the woman who drives, and in particular the woman who drove when there were no long-handled jacks—if she ever was away from other help at least—might, and does call it so.

Two great bugbears confronted the veteran woman driver, the woman who was thought very eccentric and, well, to be charitable, unusual when she learned to drive one of the two or three cars to come to town back in the early days of rough roads and rougher motoring. One was the starter. The other was the jack.

More than one woman has told the writer that she didn't mind working hard to be able to drive a stiff car, but she did hate to get down on her knees to a quitting tire and persuade the stubborn jack to do its duty. The long-handled jack has made it unnecessary to do this any more, and the starter has long been among us, so that we are finding new and lesser troubles that ruffle the smooth waters of driving.

The new driver is apt to complain that the seat is too high, or too low. Well, that is a trouble and one that should be solved, if the woman driver is to get the most out of motoring. But until each car is a special job it cannot be an individual job, and there are very few pairs when it comes down to the exact measurements of the distance from the cushion to the floor and to the brakes.

The veteran driver advises recapitulation for content. And you do not have to look very far back to the time when there was no long-handled jack, or a starter, either. With this jack another difficulty in the way of women becoming efficient and successful drivers is removed.

Has Your Home a Lunch Basket?

EVEN windy Chicago has been having some real warm weather here lately, and you can imagine how many more cars than usual were out and hiking to the country roads. All the children were along, and as for wraps, they were discarded. It makes you wonder if it isn't almost picnicking time, and if so whether last year's lunch basket is still able to stand the strain of outdoor life and strenuous trips of anywhere from half a day on.

At the used car show several accessory makers exhibited, and here were other signs of picnicking by motor. There were a motor table restaurant and a refrigerator lunch basket that ran with the running board, and a mere receptable for two cold-hot bottles and a few asides.

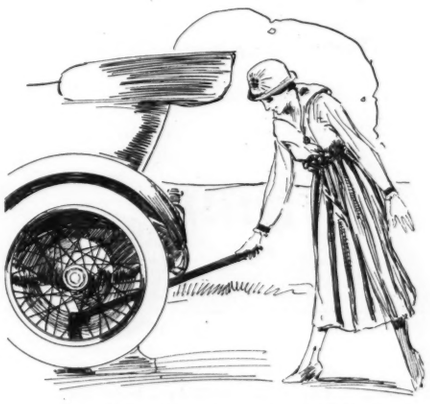
But the table restaurant was the most imposing. It was made so that it could be folded into suitcase size and carried on the running board, or in the car, if wished. When opened there was a table strongly constructed and seemingly able to stand any amount of jarring on the way, or bad table manners afterward. Agate plates, cups, knives, forks and teaspoons, and a few side issues, such as salt and pepper shakers and so on, were a part of the oufit. The entire restaurant was washable.

Then there's the table restaurant that is suspended from the robe rail and fastened to the tonneau floor for security, you know, as well as almost countless others.

University Women Form Reserve Corps

THE university men are going to France as ambulance drivers; the university women are forming reserve corps which include motor car driving. Each man who goes as an ambulance driver furnishes $350 for his first expenses, passes a physical examination and becomes versed, if he is not already so, in the ways and methods of the light motor car. The women, because they, as yet, have no assured prospect of giving their services in this way, are free from the financial worry of $350 clear. But they are living as frugal lives in a way as if they had to make this amount, and that soon.

The plan which the ambitious drivers are basing their movement on is modeled on that of Goucher College, Baltimore, Md. Goucher goes so far as to give the number of hours' sleep the women should get, the amount of work and exercise, the time for going to bed and for rising. It also prescribes the type of service dress and eliminates French heels.



The emancipated woman driver

Many university women are signing the pledge of the University Women's Reserve Corps, as it is called:

"I will use my best efforts to make myself physically fit. I will direct my efforts to becoming efficient in ——," and here, of course, the women who want to drive in real servcie—and there are many of them —write motor car driving.

Students in the various schools have signed for other work in addition to motor driving, such as sewing, poultry raising, clerical work, home nursing, dietetics, translation of French, German and Spanish, gardening and teaching.

Some of the university women have obtained leave to leave school to farm, just as so many men have done. There, perhaps, they may have opportunity to drive the tractor and thereby increase the food supply in the present emergency. That women are efficient workers as drivers of tractors has been proved in Europe, and in this country, as for that matter. The woman truck driver, that is, carrier of garden truck, too, is a a not too rare sight in America, and with the increased opportunity that women will have to serve the country in this way it is apt to become a very common sight.

There's No Salt with This Advice

EDITOR MOTOR AGE: Here is the way I keep the salt and pepper from mixing through my kitchenette and grub box. I use a 3- or 4-in. piece of ordinary garden hose the correct size to fit snugly over the top of the salt shaker, place a plug of cotton in hose, then put the pepper shaker in the opposite end of the hose, and both are then non-leakable. This may help some other motorist to keep the pepper out of his salads and deserts.—Fred C. Armstrong, Orient, Iowa.

We agree with the writer. If there is anything more annoying to the salt- and pepper-less member of a motoring party than to have to take both, willy-nilly, that member will have to exercise a lot of will power to believe it. This is a good method because so simple—when you think of it—and as the woman of the motoring party is most often the one who sees after the salads and deserts we are passing it on here so that MOTOR AGE readers may have the benefit of the idea.

By the way, why not send in some idea of your own along the same line?

The Readers' Clearing Ho

READER SPEAKS FOR LEG ROOM

Says Most Cars Are Size for Fourteen-Year-Old Boy

MONTICELLO, Iowa — Editor MOTOR AGE—What is the public asking for in the way of comforts in driving cars and touring? I have given this matter some considerable study, as to the comfort for the driver of a motor car, also for the passengers, and in my opinion, one of these that needs attention as much or more than any one is the cramped-up position of the driver's legs. The space between the front seats and the pedals is so short in the greater number of the different makes of cars, that there is hardly room for the average height of a fourteen-year-old boy to drive a car with comfort, say nothing about a man 5 ft. 10 or 6 ft. in height. The front seat should be set back enough to give the tall man a chance to stretch his legs out far enough to sit in comfort, and there should be a pedal so constructed that it could be easily and quickly adjusted without the use of bolts and made the right length for both the tall and short man.—M. H. Teeter.

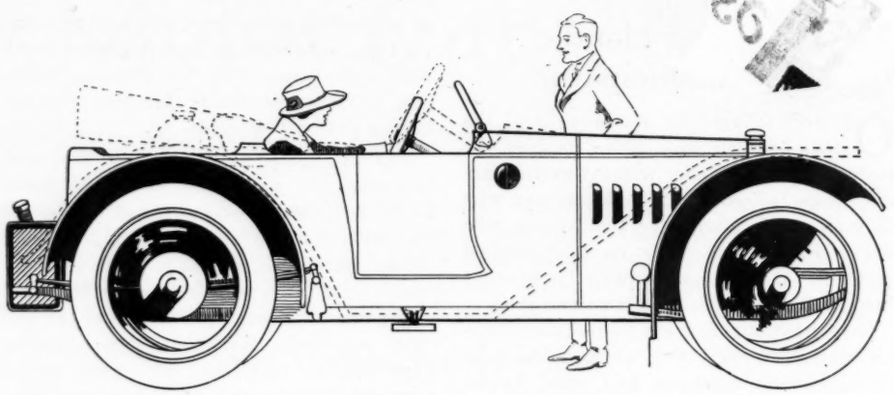


Fig. 1—Diagram showing how 1916 eight-cylinder Scripps-Booth might appear with racer body and Saxon radiator

WHY A CYLINDER SOUNDS LOUDER

Unequal Compression, Poor Valve Adjustment and Other Causes

Ellsworth, Minn.—Editor MOTOR AGE—Although compression is good, tappets set correctly, timed correctly, ignition O. K. and everything else in good shape, one cylinder has a louder and different exhaust than the others. I do not mean a miss. What causes this?

2—How can I test a Ford magneto so as to determine its working condition?

3—What causes one or two cylinders to dirty up the spark plugs with soot while the others will stay bright and clean? This soot is dry and not oily, and accumulates in spite of good compression, ignition O. K. and carbureter set lean as possible.

4—What is the bore and stroke of the Crow model C-2? I think it is 1912 or 1913 model.

5—Would it be practical to gear this car down and use it as a tractor something on the plan of the outfits attaching to Ford cars?

6—If so, about what draw-bar horsepower would it deliver at a speed of 3 m.p.h.?—A Reader.

1—This might be caused by the cylinders not having the same compression, unequal adjustment of the valves, vibrators on coils having different tensions, or by the spark plugs, one or more of which may have the points set too close or too far apart. Too rich or lean a mixture will frequently act the same, and in this case the engine may choke or back fire. Another thing to look for is a worn or partly worn timer ring. Cases like this have been found at times where the different exhaust noises were caused presumably by the shape of the exhaust manifold. When the latter is removed, each cylinder will have the same sound to the exhaust, other things being equal. With the manifold in place it must be remembered that the exhaust from the cylinder nearest the radiator has to pass through the whole length of the manifold, whereas the last cylinder is very close to the manifold opening and may give a somewhat louder report than the former.

2—If you will examine the terminals of the coil box you will find one marked Battery, and to this connect a set of dry cells, grounding the other wire. Run the car on the dry cells at about 12 or 14 m.p.h. and then throw the switch over on the magneto. If the engine misses or does not run as well as it did on the cells, the chances are the magnets are weak.

3—If this soot is soft like that which forms in a lamp chimney, it may be caused by improper combustion due to air leaks in the intake manifold.

4—The bore and stroke is 4 by 4½ in.

5—Yes.

6—There is no means of estimating accurately. However, one should expect a drawbar pull from a 26 hp. engine driving a tractor 3 m.p.h. of something like 3500 lb.

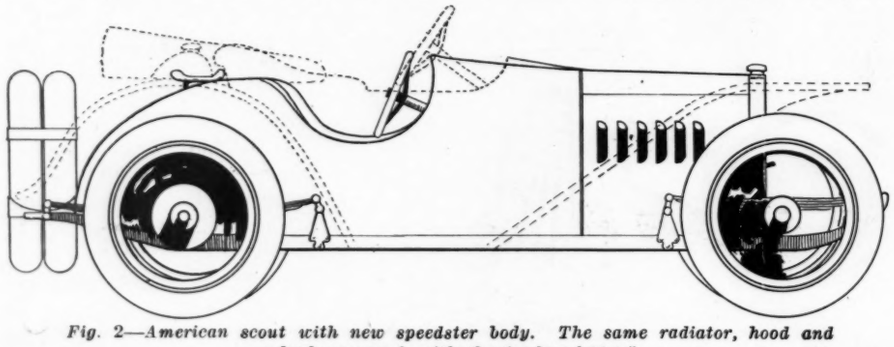


Fig. 2—American scout with new speedster body. The same radiator, hood and wheels are used, with the fenders left off

Scripps-Booth Rebuilt

Omaha, Neb.—Editor MOTOR AGE—I would like to rebuild my Scripps-Booth eight-cylinder, 1915 model into a racer using a Saxon six type radiator, and installing exhaust pipes on the outside of the body. Show diagram.

2—What is the speed of this eight-cylinder engine?

3—Could this car attain a speed of 75 m.p.h. if geared up and put in first-class condition, using Lyonite pistons?—Ray Magginus.

1—A diagram made following your ideas is shown in Fig. 1.

2—If you mean the maximum r.p.m there have been no tests made which establish an official performance.

3—It might and it might not. It is within the possibilities, but it would take very accurate and careful rebuilding and tuning to bring it up to such a speed.

Hudson 33 Rating

Reotone, Ill.—Editor MOTOR AGE—What is the horsepower of the engine on the 33 Hudson, 1912 model, according to the S. A. E. rating?—Henry Koenning.

The rating is 25.6.

American Scout Cut Down

Danville, Ill.—Editor MOTOR AGE—Print sketch of an American Underslung scout cut down and made into a speedy type, four passenger roadster, following as far as possible the lines of Mr. Brasor's sketch in MOTOR AGE for April 12, 1917.

2—Do you think the frame is long enough and the engine powerful enough to permit such a design? If not, make the sketch a two-passenger rather than a four-passenger design.

3—Can ordinary Hartford shock absorbers be used on this type of car or should they be of special construction?

4—What is the gear ratio on this car.

5—Would it be advisable to put a higher gear on this car?—Russel M. Duffin.

1—A sketch of how such a car might look is shown in Fig. 2.

2—The car is well adapted to use such a body as sketched.

3—There should be no trouble expe-

rienced in fitting these devices without special equipment.

4—The standard gear ratio was 4.07 to 1.

5—No.

WHY OF ERRATIC ENGINE ACTION

May Be Intermittent Action of Cooling or Oiling System

Lead, S. D.—Editor MOTOR AGE—My 1915 Paige runs nicely when running light and also with a load at times. Sometimes it has power to spare and all at once it will not pull at all, and, although shifted to low gear, it will not pick up until it has been cleaned out. I replaced a model 12 Stewart carbureter with an H. 1 Stromberg, but with little improvement. The engine has a tendency to overheat and usually does not lose power until the water is near the boiling point. What is the trouble?—C. E. Monett.

Granting that all the ordinary adjustments are right, there are several explanations of the malady from which your engine seems to suffer. The fact that it has plenty of power at times and then balks, would seem to indicate an intermittent action of the lubricating or cooling systems. Overheating is the natural result of such an action. Whenever a car owner becomes conscious of a falling off in the power of his engine, he should check up on the oiling system, ignition, cooling, carburetion and valves. Carbon deposits on the pistons, valves and cylinder head will cause an engine to act erratic, but in the case you mention it is suggested that you see if there are any obstructions in the cooling system which would restrict the proper flow of the water. Also the oiling system should be gone over thoroughly. Sometimes pieces of the carbon which forms inside the pistons, traceable to the oil thrown upward, after a time, break off under the influence of the explosion shocks and drop into the crankcase, where they are liable to choke up the oil-ways and oil strainers, thus depreciating the proper lubrication of the engine.

Why No Ten Cylinders

Thurber, Tex.—Editor MOTOR AGE—Are ten-cylinder cars practicable and have they ever been tried out?

2—The front cylinder on my Ford 1914 M. misses on account of oil coming up and fouling the plug. I have made oil grooves in the piston and drilled holes in the piston and fitted new rings, but without results, although oil is at proper level, ignition and carburetion O. K. Would drilling a hole from the valve chamber into the crankcase help?—E. Amidel.

1—In conventional engine designs ten-cylinder engines are not practical because they do not permit of a theoretically correct balance.

2—No. You should not drill a hole from the valve chamber to the crankcase. The holes you have drilled in the piston may in reality assist in pumping the oil into the cylinders rather than prevent it. Try non-leaking rings.

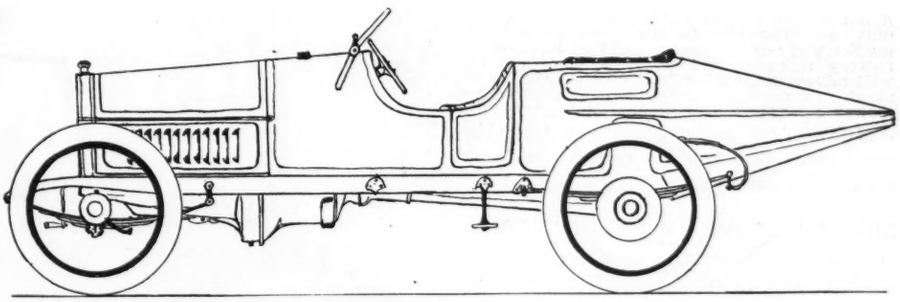


Fig. 3—A 1912 Buick model 29 rebuilt by MOTOR AGE reader. It is convertible to afford sleeping quarters

Inquiries Received and Communications Answered

M. H. Teeter	Monticello, Iowa
A Reader	Ellsworth, Minn.
Ray Magginus	Omaha, Neb.
Henry Koenning	Reotone, Ill.
F. C. Hodges	Garland, Tex.
C. E. Monett	Lead, S. D.
E. Amidel	Thurber, Tex.
Charles Kendall	Weatherford, Okla.
W. R. Shepherd	Charlottesville, Va.
E. Nussbaum	Peoria, Ill.
A. W. Fisher	St. Petersburg, Fla.
A. H. Kreider	Lebanon, Pa.
J. Mohammed Ali	Birmingham, Mich.
E. R. Ritter	Cincinnati, Ohio
George Lundberg	Lansing, Mich.
Williams	Detroit, Mich.
Floyd L. Stickney	Lake Placid, N. Y.
Casper Davis	Wilmot, Ark.
I. L. Yancey	Campbell, Tex.
S. R. Warren	Elko, Nev.
Arthur F. Borman	New Haven, Conn.
George Jones	Drumright, Okla.
W. P. Walsh	Sudlow, Ill.
X. Y. Z.	Connersville, Ind.
Karl Kraus	Mason City, Iowa
G. C. Garrett	Fort Worth, Tex.
R. B. Rodgers	Santa Monica, Cal.
E. O. Patterson	Bushnell, Neb.
Clarence L. Nickerson	Ellis, Neb.
H. D. Williams	Salinas, Cal.
J. Y. Montrey	Tampa, Fla.
J. R. Fedders	Garden City, L. I.
A Reader	Norwalk, Va.

Speedster Also Sleeper

Weatherford, Okla.—Editor MOTOR AGE—In Fig. 3 is a diagram of a 1912 Buick model 29, which I have rebuilt. It has a Miller carbureter and Bosch high-tension magneto; also oversize tires. It is a three-passenger. The front seats, which are of bucket type, can be taken out by removing two thumb screws, and a comfortable bed can be made on the floor of the car. The door opens into one side of the left front seat; there is a small space left between the two front seats so that the passenger wanting to get in the back seat can go between the two front ones; thus necessitating but one door. There is a gas tank in the cowl that holds 8 gal. and an oil tank that holds 2 gal; there is also a space on each side of the third seat which has small openings on the outside of body; these can be used for gloves, etc.—Charles Kendall.

Hupp 20 Speedster

Charlottesville, Va.—Editor MOTOR AGE—Illustrate Hupmobile 32 1914 remodeled with speedster body, with sketches showing rear as well as side view if possible.—W. R. Shepherd.

Sketches of the rear and side view of a speedster body adapted to this car are shown in Fig. 4.

Knock Probably Piston Slap

Peoria, Ill.—Editor MOTOR AGE—A dull knock is apparent in a 1915 Studebaker four which occurs when the engine is hot. The main bearings are tight, the connecting rod bearings are also all right; the wrist pins seem to be all right, and by shorting the plugs the knock remains the same. The camshaft bearings are all right with the exception of a little end play; the ignition and carbureter adjustment seem O. K. and all carbon has been removed. What is the cause of the knock or how may I be able to locate it?—E. Nussbaum.

If you are sure that all parts are all right as you outline, it would appear that the knock is a piston slap caused by one of the pistons having become a loose fit in the cylinder. This can only be determined by tearing down the engine and wobbling each piston back and forth in the cylinder. If one seems to have considerable play you can be practically sure that this is the cause of the knock.

Where Can He Get Muffler?

St. Petersburg, Fla.—Editor MOTOR AGE—I have a two-cycle, two-cylinder engine, bore and stroke 4½ by 4½. This car has had

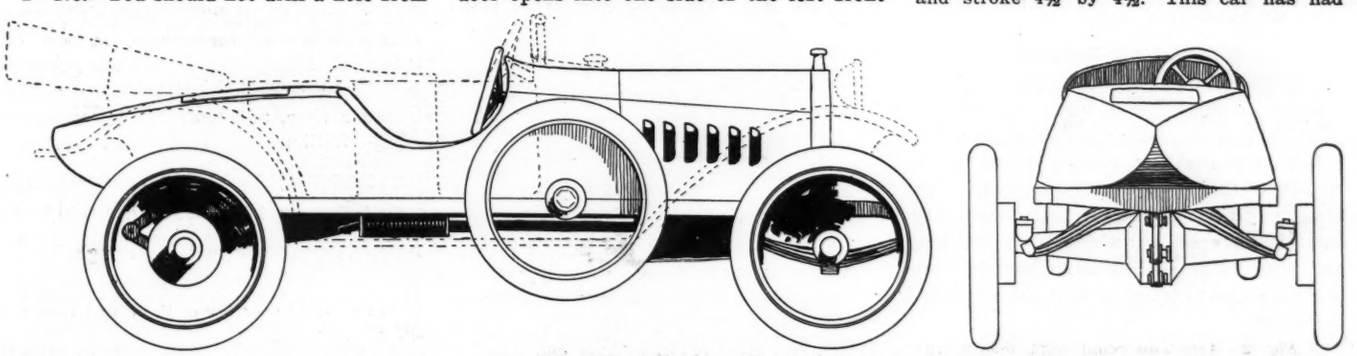


Fig. 4—Side and rear view of Hupmobile model 20 converted into a speedster

much service and is distinctly a success, the only objectionable feature being that the muffler will not silence the exhaust in a satisfactory manner. I have tried a couple of well advertised makes but with no improvement. Question before the house—who makes a muffler?—A. W. Fisher.

MOTOR AGE readers, can you tell this man where he can get a muffler that will silence his two-cycle engine?

LOSS OF POWER IN REBUILT FORD

Deficiency Probably Due to Oiling, Cooling or Carburetion

Lebanon, Pa.—Editor MOTOR AGE—I have rebuilt a Ford for speed work and find that the motor will not stand the throttle being opened for any length of time. It will start with a spurt with good power, but, after running a mile, will slow up as though overheated, although the meter will not show the water to be over 150 deg.

The machine is equipped with aluminum-alloy pistons, Atwater Kent ignition with storage battery, tungsten-steel valves, racing camshaft, 3 to 1 gear ratio and extra oil supply to crank case. The car will show a speed of 30 m.p.h. on low gear, but will not continue a speed of over about 50 m.p.h. on high gear without showing the above symptoms. Do you think the fault lies with the water circulation?

2—Advise who makes a water pump for Ford car.—A. H. Kreider.

1—It is probable that this falling off in power is caused by deficiencies in the oiling, cooling or carburetion of your engine. If in the oiling, it may be due to too light an oil, interrupted oil feed or oil of poor quality. The cylinder walls may also become more or less dry by the pistons binding in them. Tight bearings will also prevent proper lubrication. Should the trouble seem to be in the cooling system, look for a slipping fan belt or obstructions in the water system. Sometimes the hose connections between the radiator and engine are not properly made as shown at A in Fig. 6. The inner layers of the hose are often bent as shown, thus presenting a smaller opening for the heated water to pass through to get to the radiator. The proper way to make these connections is shown at B. Also it may be advisable to solder an auxiliary tank to the upper tank of the radiator as shown at C. This tank can be made to hold about 1 gal. Copper is the best metal to use for this tank.

There are many other reasons why your engine loses power and among them might be mentioned the following: Too rich a mixture, stuck air valve, partially clogged gasoline line, points on distributor and plugs not set right, driving with retarded spark, carbon deposits, binding slow-speed and reserve bands, dragging brakes in rear hubs, too much or too little space between valves and push rods, etc.

2—We know of no one.

Soft Water in Radiator

Birmingham, Mich.—Editor MOTOR AGE—Is the use of very hard water apt to cause radiator trouble? Would you suggest the use of rain water from the roof and not very clear, in preference?—J. Mohammad Ali.

Hard water will cause lime incrustations within a cooling system in exactly the same way that it will in a tea kettle. It is a slow process for this lime to collect, and with most cooling systems, the passages are great enough so that little trouble is caused.

However, if you have plenty of rain water on hand there is no reason why you should not use it in order to avoid this lime deposit. If the water appears to be muddy, allow it to settle and pour off the top into the radiator.

Fig. 5—Yes, this is a Ford. According to a correspondent it can be built for $700, and this includes an ultra complete equipment

What Can Be Done to Ford

Cincinnati, O.—Editor MOTOR AGE—Nearly every car owner and every Ford owner is interested in built-over Fords—something that will change the Ford's appearance and make it look different than the million others on the road. Inclosed are some photos showing what can be done with a Ford. This car could be built for $700, and in lots for considerably less.—E. R. Ritter.

Concerning Junior Racers

Lansing, Mich.—Editor MOTOR AGE—Furnish plans for building a Junior racing car.

2—Where could I get the wire wheels and tires?

3—Where could I get a chassis?

4—Could I make the body or have it made?—Geo. Lundberg.

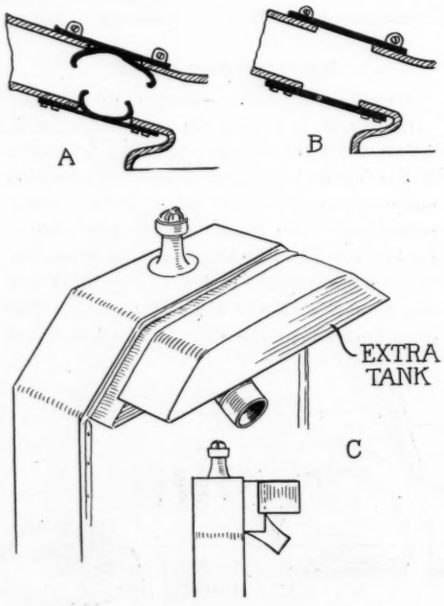


Fig. 6—A shows improper hose connection, which allows too small a quantity of water to pass. The proper connection is shown at B. C shows how an auxiliary tank may be soldered to a Ford radiator

1—Plans for these cars with complete descriptive matter will be found in the articles by Harry Hartz in the MOTOR AGE issues of May 3, 10 and 17.

2—Wire wheels may be obtained from Houk Mfg. Co., Buffalo, N. Y.

3—You would have to build it. The specifications are given in the articles above referred to.

4—No one, to our knowledge, is building such a body. It would have to be a home-made job.

SEVEN CARS ARE MADE INTO ONE

What Happened When Various Parts Were Mixed

Detroit, Mich.—Editor MOTOR AGE—Did you ever wonder what kind of a car would result, if the mechanic happened to get the parts mixed in the repair shop? W. D. Seanor, mechanic in the Woodward Tire & Repair Co., Detroit, did practically that, and the result was a distinctive car, see Fig. 8.

Seven makes of cars furnished the main parts, and the smaller parts were taken from twice as many others. The frame is from an old Speedwell. It has a Buda engine, Packard rear axle and gearbox, Weston-Mott front axle, Glide radiator, Hudson 33 mudguards and tank, Ajax steering wheel, Schebler carbureter and Bosch magneto. The body is special, and the car has a 136 in. wheelbase.

In the construction, an entire Packard frame was cut up, and made into cross braces, and re-inforcements on the old Speedwell frame. About $50 was spent on special drop forgings. The car was built in spare time, at a cost of approximately $900.—Williams.

ON RECHARGING FORD MAGNETOS

6-Volt Battery Not Strong Enough to Do Work

Lake Placid, N. Y.—Editor MOTOR AGE—How do you recharge Ford magnetos without removing the engine from the chassis?

Can a 6-volt starting or lighting battery be used for the purpose?—Floyd L. Stickney.

A 6-vole battery will not be strong enough to recharge the magnets and to do

the job properly you will need in the neighborhood of 30 volts. Five or six 6-volt storage batteries should be about right. Refer to Fig. 7. To prepare the magneto for recharging first disconnect the wire A which goes from the magneto terminal on the transmission cover to the coil on the dash. Next remove the transmission cover B, so you can look at the magneto. Locate the brass studs on the rim of the flywheel which hold the magnets in place, and have some one turn over the engine very slowly until one of these brass studs is in line with an imaginary line drawn about 1 in. or so from the magneto terminal, to the left of the latter and paralleling the frame. Another way is to place an ordinary small compass on the transmission cover about 1 in. from and to the left of the magneto terminal, at the same time turning the engine slowly until the needle of the instrument is parallel with the engine. The north pole end of the needle should point towards the engine when in this position. Connect a wire from the positive terminal of the batteries to the magneto terminal on engine, as shown by C. Next connect a wire from the negative terminal on battery, and make and break the circuit by striking the free end of the wire on some metal part of the engine. Permanent connection should not be made, but only thirty or so momentary contacts, which, it is said, will recharge the magnets much more satisfactorily than if permanent contact is made. Descriptions of other methods of doing this job may be found in last week's Readers' Clearing House department.

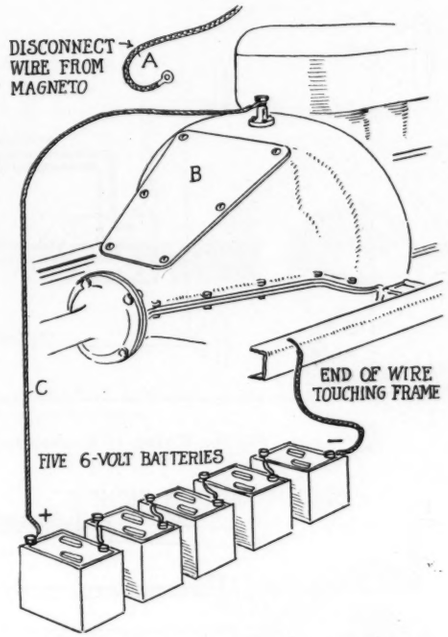


Fig. 7—Necessary connections to charge Ford magneto magnets from five storage batteries

EFFECT OF UNEVEN COMPRESSION

Sparks May Not Jump Gap With High Compression

Wilmot, Ark.—Editor MOTOR AGE—Do different compressions affect the power of the explosions of an engine? My idea has been that a weak compression on one or two cylinders and high compression on the remainder would cause an engine to jerk. Is it possible that a high compression could make it more difficult for a spark to jump the gap at the spark-plug points?

2—Is a higher compression still in demand for motor car engines, and would it be of any advantage to have a device for high compression?

3—What is the reason for the 1917 Studebaker six and the Oldsmobile eight not having a cutout on the exhaust pipe?

4—Does a muffler cause back pressure?—Casper Davis.

1—It is true that different compressions affect the power of explosions and that an uneven compression ratio in different cylinders will, consequently, cause an engine to jerk. If the compression is excessively high it can keep the spark from jumping the gap in the plug.

2—High compression engines go hand in hand with high-speed engines. This means high compression in comparison with the compression used in the slow speed engines of a few years ago. Of course, compression can be raised to such a high figure that the gas will be ignited by this high compression alone, such as is the case with Diesel engines. If you mean, would it be of advantage to raise the compression of some certain car, our advise is to the contrary. The engines are designed throughout to take care of a specified compression, and the performance of these engines might be impaired rather than improved by the act of increasing the compression.

3—Because cut-outs are not permitted in the majority of cities, and furthermore, because the public is becoming more stable in its use of motor cars, desiring quiet action of the car rather than noisy exhibition work. In cars such as the two you mention there is no logical need for a cut-out.

4—Yes. The modern mufflers, however, cause such a small amount that the factor of power loss under ordinary driving conditions is practically negligible.

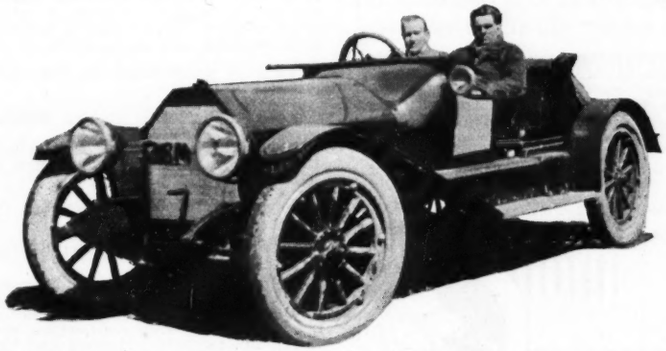


Fig. 8—This car is the result of a conglomeration of the parts of seven makes. The frame is from a Speedwell, the engine is a Buda, there is a Packard rear axle and gearbox, the front axle is Weston-Mott, the radiator is from a Glide, mudguards and tank are from a Hudson 33, the steering wheel is an Ajax. The car was built in spare time at an approximate cost of $900

SOME REASONS FOR ENGINE KNOCK

Reader Has Noisy Engine at Over 20 M.P.H.

Campbell, Tex.—Editor MOTOR AGE—My model 83 Overland has developed a peculiar knock which is more noticeable on pike road when running over 20 m.p.h. than when idle and motor running slowly with spark retarded. It seems to be in the third cylinder. I have tightened all the wrist pins and one main bearing, but it still knocks. It is not noticeable when pulling hard. Could piston be loose on connecting rod? How could I tighten same?—**I. L. Yancey.**

This knocking may be attributed to over-advanced ignition, or to faulty carburetion, but if, in spite of attention to these, it persists, it is generally to be associated with excessive carbon deposit. On the other hand it may be due to a loose connecting rod or wrist-pin bearing, worn piston, causing a side slap against the cylinder walls or some other mechanical defect. If your car happens to be fitted with an engine the cylinders of which are cast singly, this knocking may be due to loose cylinder retention bolts. That is, the bolts holding the cylinders down on the crankcase may need tightening on one or more cylinders. A loose piston pin may be due to the set screw becoming loose, or it may be caused by wear. In the latter event the pin should be replaced with a new one of the proper diameter and length.

ATTRIBUTES KNOCKS TO WRIST PIN

They Should Not Be Permitted to Exist—Remedy the Trouble

Elko, Nev.—Editor MOTOR AGE—I have just put in new pistons and piston rings in a 1914 Studebaker touring car. There is a very distinct knock when the engine is running which I believe is due to my having fitted one piston pin quite tight, causing a piston slap. If this is the trouble, will the pin in your opinion, be likely to loosen up after the car is run a 100 miles or so? The pin was tight enough so that in order to move the piston it was necessary to grasp it quite firmly with the hand. If left to loosen up by itself, is it likely to damage the cylinder wall; that is, wear it out of round more rapidly than usual?—S. R. Warren.

If there is a very distinct knock within the engine, the engine should not be run farther until this knock is remedied. If it is in the wrist pin, you can take this pin out and dress it down by putting it in a vise and polishing it with a strip of fine emery cloth, wrapped about it. However, if the pin is only so tight that it may be moved by grasping firmly with the hand, it would be our assumption that the cause does not lie here.

Rather we would say that one of the pistons, or possibly the rings in one piston, are an imperfect fit.

Negative Terminal Bubbles

New Haven, Conn.—Editor MOTOR AGE—In your issue of April 12, 1917, on page 35 you have an article on finding polarity of wires. You state that the positive terminal will give

off a spray of bubbles when dipped in salt water and the negative remains inactive.

In your issue of Aug. 3, 1916, on page 25 there is an article which also tells how to distinguish positive from negative terminals. It says to connect a wire to each pole and dip the ends of the wire into a glass of water. The current decomposes the water into hydrogen and oxygen, the hydrogen coming off the negative pole and the oxygen off the positive terminal. As there is twice as much hydrogen as oxygen in water, the terminal giving off the most bubbles is the negative.

These articles seem to be conflicting. Will you state definitely which is correct.—Arthur F. Bormann.

It is the negative wire that gives off the spray of bubbles. We were in error.

THIS NEW ENGINE LABORS—IS STIFF

Galloping Engine May Be Due to Several Causes

Drumright, Okla.—Editor MOTOR AGE—What is the trouble with a Dodge engine in a new car when laboring hard in any gear? With spark retarded or advanced, there seems to be a jerk in the engine as though the spark was too far advanced or the explosion too great.

2—What could be the cause of a Dodge engine with Stewart carbureter running fast and then slow when standing idle? Cleaning out the gas system and other adjustments does not have any effect. Cylinders are clean and compression and ignition good.—Geo. Jones.

1—If the spark were too far advanced or the explosion too great, which would mean excessive compression, there would probably be a knock in the engine. If there is no knock, and there is even firing in all cylinders, it would be safe to say that the trouble lies in the fact that the engine is still stiff, and that it will run smoothly after it has been given another 1000 miles or so.

2—This galloping of the engine at low speed can be due to a number of things. The first thing one should look to would be a weak spark. It would also occur with incorrect low-speed adjustment of the carbureter. Leaky valves could also be a cause.

CLINCHER TIRES NOT FOR RACING

Will Peel Off of Rims When Car Is Driven Fast

Sudlow, Ill.—Editor MOTOR AGE—What gear ratio was used on the Overland which took third place in the Phoenix race Nov. 20, 1915?

2—Does MOTOR AGE advise the use of castor oil in a stock touring car? What are its advantages and disadvantages compared with mineral oil?

3—Are regular clincher tires satisfactory for ½ mile track racing when the turns are taken at high speed?

4—In repairing a small blowout, is an inner shoe as satisfactory as a vulcanized patch if the outside of the casing is vulcanized to keep out dirt and moisture?

5—What causes inner tubes to burst without injuring the casing?

6—Does MOTOR AGE consider a device which heats the intake manifold better than one which feeds hot air into the carbureter?

7—Will an extra size carbureter give more speed using the same size intake manifold?—W. P. Walsh.

1—3⅛ to 1 was the gear ratio.

2—Yes, a combination of castor and petroleum oil. There are several such compounds on the market.

3—No, not if you are considering speeds around 75 to 100 m.p.h.

4—No. An inner shoe is a protector to counteract a weakness in the casing. The tube should be vulcanized.

5—Defects in the rubber, deterioration, or particles of sand or dirt which have been left between the casing and the tube.

6—They both serve the same purpose, to heat the gases entering the cylinder. Heating the manifold has a more direct effect.

7—No. The size the carbureter maker specifies is the one which will give the best results.

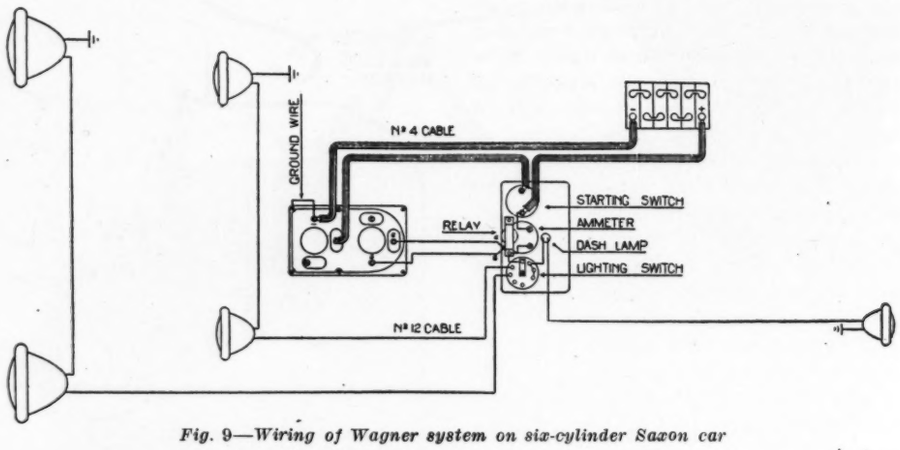


Fig. 9—Wiring of Wagner system on six-cylinder Saxon car

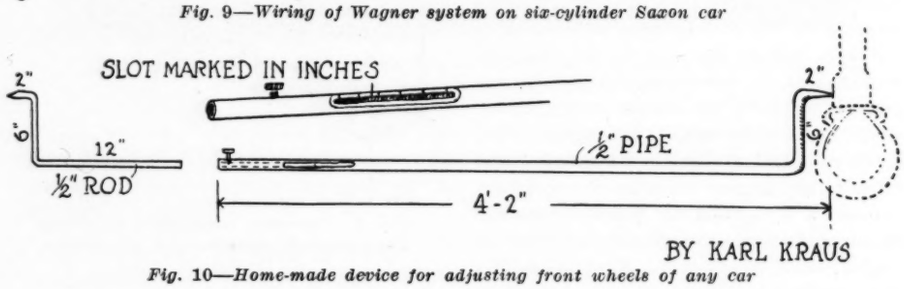


Fig. 10—Home-made device for adjusting front wheels of any car

Carbureter for Old Car

Mason City, Iowa—Editor MOTOR AGE—In Fig. 10 is a sketch of a simple thing which I have made. It explains itself.

We suggest a piece of Electric conduit instead of gas pipe as it is smooth on the inside and a rod ⅝" will fit it very closely.

1—What carbureter does MOTOR AGE think is best for an E. M. F. 30 1912 to make it start easier and save fuel and run good.

2—Has the Kelly-Springfield tire a patent on their non-skid tire?—Karl Kraus.

1—Any standard and modern maker, using the type specified by the manufacturer.

2—The use of the words to form the non-skidding medium are protected.

Wagner Wiring on Saxon

Connersville, Ind.—Editor MOTOR AGE—After a complete overhauling of my Saxon six, I find myself at a loss to know how to wire it properly. It is equipped with the Wagner starting and lighting system. Publish a diagram of the wiring.—X. Y. Z.

The diagram will be found in Fig. 9.

A Correction

Santa Monica, Cal.—Editor MOTOR AGE—Referring to the communication from B. E. Elliott on finding the polarity of wires in the April 12 issue: I beg to differ with this gentleman, for, if two wires are dipped in the solution of salt water it is the negative terminal that gives off the fine spray of bubbles and not the positive wire, as stated in his article.—R. B. Rodgers.

You are correct. It was a misstatement.

Norwalk a Speedster

Fort Worth, Tex.—Editor MOTOR AGE—The rear system wheels and body of my Model D. Special Norwalk car have been burned, so wish to convert it into a roadster or speedster. Give diagram showing how this may be done.—G. C. Garrett.

This is illustrated in Fig. 11.

Piston Rings in Buick

Bushnell, Neb.—Editor MOTOR AGE—Give me the size of the piston rings in a model D-45, 1916 Buick.—E. O. Patterson.

The rings in question are 3¼ in. by $\frac{5}{16}$ in.

What Knock Might Be

Seymour, Wis.—Editor MOTOR AGE—My 1914 Jeffery four has a peculiar knock in the engine. The carbon has been scraped, valves ground, main and connecting-rod bearings taken up, tappets adjusted and the oil pump has been examined. The knock is most audible when the motor is idling. At 20 m.p.h. or more the engine runs very smooth. What is the trouble?—J. D. Webelowsky.

If the knock has a metallic sound it may be that the timing gears are loose on

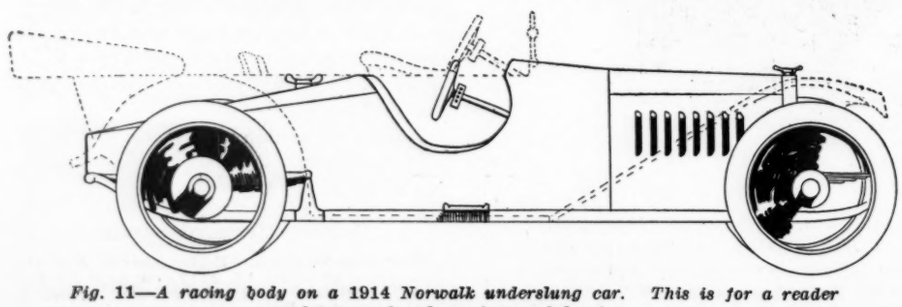


Fig. 11—A racing body on a 1914 Norwalk underslung car. This is for a reader whose car has been damaged by fire

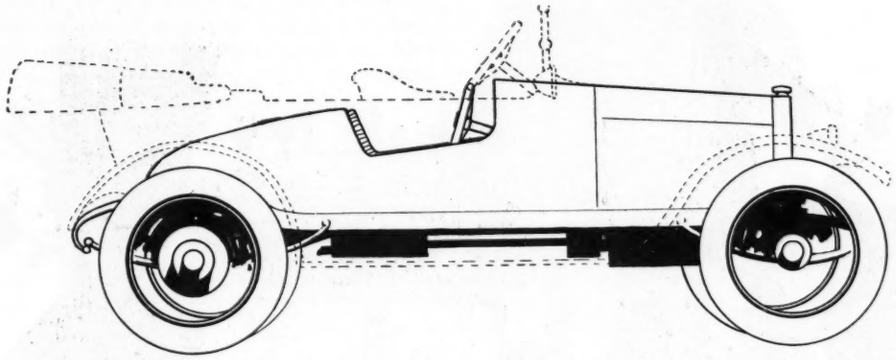


Fig. 12—Simple speedster body for use on a model 81 Overland This is designed to be built at a minimum expense

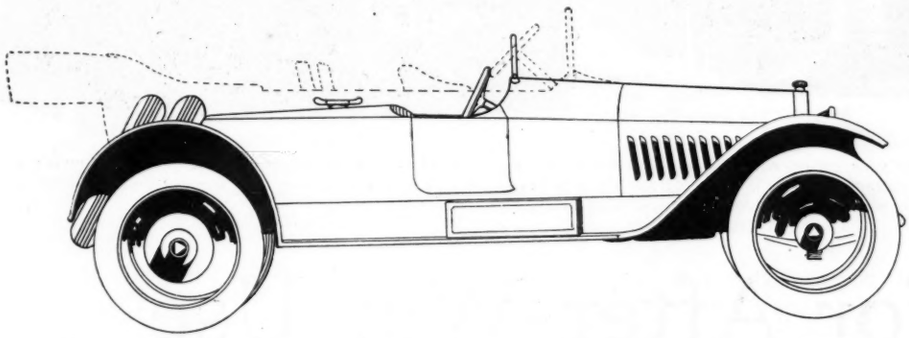


Fig. 13—Straight-line speedster body on a model 54 Hudson. It has a long, sweeping rear deck and low seats. The gasoline tank is carried behind the seat and has a racing-type filler cap in accordance with the correspondent's idea

their fastenings or that the teeth are worn, or the gears meshed too deeply. The camshaft may be loose or the cams of worn contour. The piston may be binding in the cylinder or worn oval causing side slap in the cylinder. The wrist pin may be loose in the piston. There may be a binding in the crankshaft bearings caused by too tight a fit. The engine base may be loose on the frame. The bolts may be loose on the lower half of the crankcase. The flywheel may be loose on the crankshaft, etc.

Inasmuch as the engine seems to knock only when idling and runs very well at 20 m.p.h. and over, it would be well to look first to the engine supports, to the flywheel for tightness or to the fit of the cylinder head on the crankcase. Low speed might cause a vibration which would create a knock in these places, and then the vibration would be broken up when the engine was accelerated so that the knock would not be apparent at this higher speed.

Wiring of Oakland 35

Norwalk, Va.—Editor MOTOR AGE—Publish wiring diagram of Oakland model 35 equipped with Deaco starting and lighting system and a Remy magneto. Show clearly in this diagram how an ammeter should be wired.—J. D.

The diagram is published in Fig. 14.

Speedster on Hudson 54

Tampa, Fla.—Editor MOTOR AGE—Having just overhauled my model 54 Hudson car, I am now contemplating the construction of a speedster body for it.

I am willing to go to considerable expense to make this a job of class. I want straight lines throughout with a long, sweeping rear deck and low seats. The gasoline tank would be carried in this rear seat, with a racing-type filler cap. The back of the deck should be so shaped that two tires can be carried compactly against the car. Publish a sketch.—J. Y. Montrey.

The MOTOR AGE artist has endeavored to carry out the lines you suggest in the sketch in Fig. 13.

EFFECT OF WHEEL SIZE ON SPEED

Would Not Consider 28-In. Wheels Good for Racing

Salinas, Cal.—Editor MOTOR AGE—I wish to convert a Ford into a racer.

1—Can I get wire wheels 28 by 3½ and tires to fit same?

2—Would smaller wheels increase or decrease the speed?

3—What is the safest and least expensive way of lowering the Ford frame?

4—Give address of a firm making Fiat-type radiators.—H. D. Williams.

1—You can get standard 28-in. wire wheels which will take either 28 by 3 or the oversize tire.

2—It depends entirely on the gearing. That is the relation of engine speed to rear axle speed. With the same gear ratio it is very probable that you could get more speed with 30-in. tires than with 28-in. tires, and we would advise the use of the former for racing.

3—By the method described in the article, Making the Ford Car Fast, on page 34 of the March 1 issue of MOTOR AGE.

4—We have no specifications of a true Fiat type radiator for use on a Ford. Thinking that some MOTOR AGE reader may know where one can obtain such a radiator, we are inserting a special question on these pages.

Simple Speedster on Overland

Garden City, L. I.—Editor MOTOR AGE—I am going to build a speedster body myself for my Overland model 81. I cannot spend much money on the job, and, inasmuch as I am not an experienced sheet metal worker, the design of the body will necessarily have to be simple.

Publish a sketch of a speedster body on this model with a simple turtle back. I would not want running boards or fenders.—J. R. Fedders.

A sketch of how your car might appear is shown in Fig. 12. This is about as simple a speedster body as could be designed, unless you wanted a stripped chassis only with a couple of bucket seats.

Where's This Radiator?

H. D. Williams, Salinas, Cal., is looking for a Fiat-type radiator to fit onto a Ford car which he is rebuilding into a racer. It occurs to us that some of these have been special made in California, although we lack the address of the maker. Can some MOTOR AGE reader assist our correspondent in finding such a radiator?

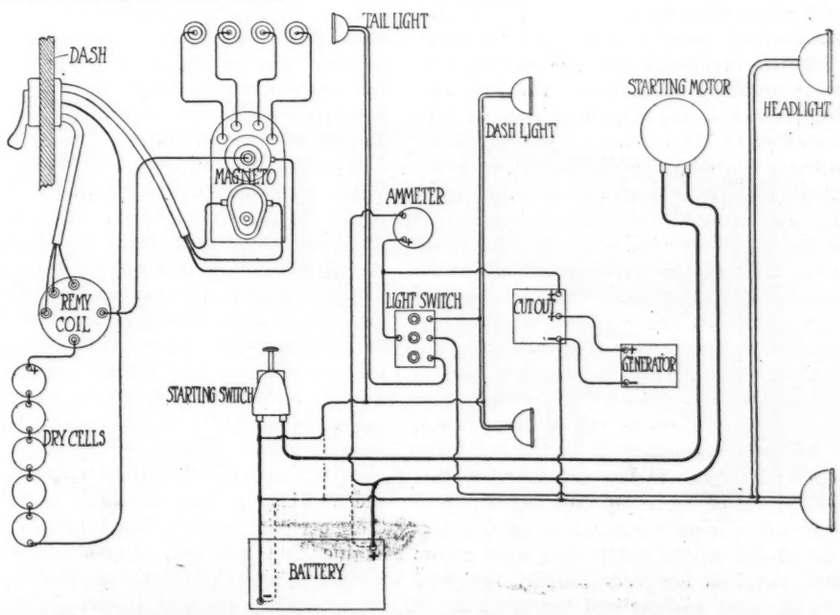
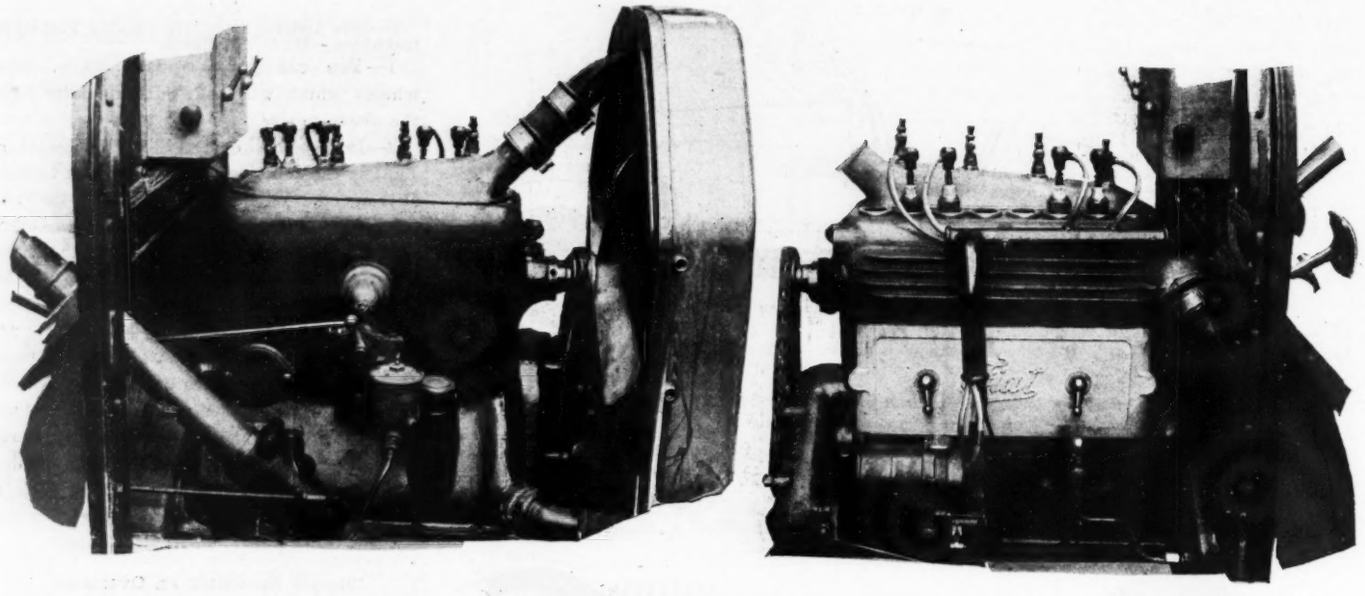


Fig. 14—Wiring of Oakland model 35 equipped with Remy magneto and Deaco starting and lighting system



At the left is the Fiat post war model engine with cylinders and crankcase in one casting. Note the water intake and the air passage in cylinder casting through which air is taken into the cylinders with the fuel. At the right is the valve side of the Fiat post war model. Note the sliding base for the magneto, the ribbed exhaust manifold and the pressure pump

Fiats for After-War Use

New Four an American Model Italianized

Chassis view of the Fiat post war model shows rigid construction. The springs are underslung

CREDIT for producing the first of what may be termed the European post-war models must be given to the Fiat Co. of Turin, Italy. The appearance of the car disposes of the illusion that when fighting comes to an end there must be a considerable interval before the European motor car factories are able to return to their ordinary production. The Fiat factory, which is the largest in Europe, with a staff of 18,000 workmen, is entirely under military control and is producing vast quantities of war material. Nevertheless, it has been possible not only to design but actually to build and start the first series of a new model intended for after the war condition and after the war competition. The past policy of this company has been to produce a wide range of high-grade models, varying from the smallest four to the biggest six, seeking by this variety to satisfy every class of client. In a word, it has been the policy of all the big European motor car factories. Whether this policy will be continued it is impossible to say, but a mere examination of the new car offered to the public this week shows that the firm has very broadly reviewed the situation and realized the necessity of adopting a design which would tend towards a lower cost of production and so lower the selling price. Summarized, the new car can be described as a popular American model Italianized.

Engine a Four-Cylinder

Rated at 15-18 hp., the new model has a small, high-efficiency four-cylinder engine which very advantageously fits into the European horsepower taxation scheme; it is sold complete with a factory built body, and has electric lighting and starting as an integral part of the car. This is the first time a really important European motor car concern has offered an electric lighting and starting equipment which was not an accessory to be accepted or left as client desired. Other new features are cylinders and upper half of crankcase in one casting, a ball bearing crankshaft, thermo-syphon cooling, unit construction of engine and gearbox, demountable steel wheels, flywheel circulated oil system, and all accessories such as electric horn, luggage rack at the rear, spare wheel, a top with a cover to protect it when folded, etc. The car is as complete and as ready for the road as any American built model offered to the public. This may seem an unimportant matter, but it is significant of an important change in attitude when it is realized that Fiat has grown up with the European idea of producing a good chassis and leaving the purchaser to secure a body and fit the accessories which suit him or which he can best afford.

The cylinders are block-cast and the bore is 2.7 in. and the stroke, 5.1 in. Cylinders are of the L-type with the upper half of the crankcase cast integral. A detachable cylinder head is not used. The base chamber, which is nothing more than an oil reservoir, is an aluminum casting, as are also the timing gear housing and the valve stem plate. All castings are sand blasted, the finish of the car showing no falling off compared with previous Fiat models. The engine is three-point suspended, the two rear crankcase arms being bolted to the frame members, the retaining bolts passing through aluminum blocks in the section of the frame, and a trunnion mounting being employed on the front transverse frame member.

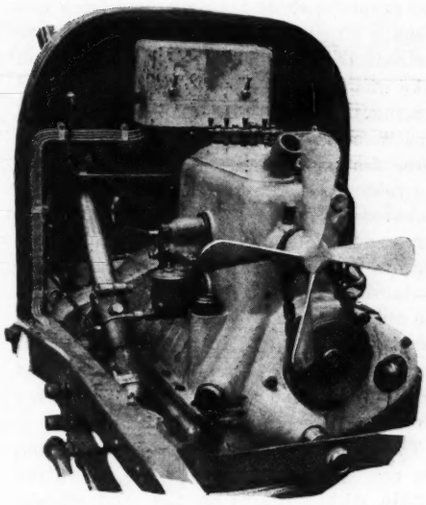
The second unit, which is bolted to the engine, but not attached to the frame in any way, is an aluminum casting comprising one-half of the housing round the flywheel, the clutch, the gearbox, the brake and change speed control mechanism. This not only reduces the amount of material, but makes assembly less expensive and automatically provides for the lubrication of a number of parts which previously needed to be attended to with an oilcan.

The cylinders are cast with ribbed integral exhaust manifold and gas passages in the casting, so that the carbureter is bolted up direct. For the first time Fiat has adopted silent chain drive for the cam and magneto shafts, for it is worth noting that although electric starting has been adopted the magneto has been maintained. Doubtless this is a concession to European taste, for the magneto is considered the best ignition, as witness the ease with which they can be sold as an accessory to the Ford. In this case the magneto is placed longitudinally on the valve side, mounted on a sliding base, so that its lateral displacement will allow of the tightening of the driving chain. There is full accessibility, for the top of the magneto is just level with the bottom of the valve stem chamber, and its base is only slightly below the frame member. The ignition point is variable.

Single Bolt Attaches Carbureter

On the opposite side the two-jet Fiat carbureter is secured to the cylinder casting by a single bolt. There is an air intake around the base of the jets, but the main air is drawn through a passageway in the casting, the mouth of which, covered with a wire gauze, is just to the left of the carbureter, and is shown in one of the illustrations. At this side of the engine is the combined oil filler and breather, to the right of the carbureter, and to the left of this organ is a steel rod indicating the height of oil in the basechamber.

The connecting rods are H-section steel forgings machined all over, with phosphor bronze bearings lined with white metal. There are two bolts for each connecting



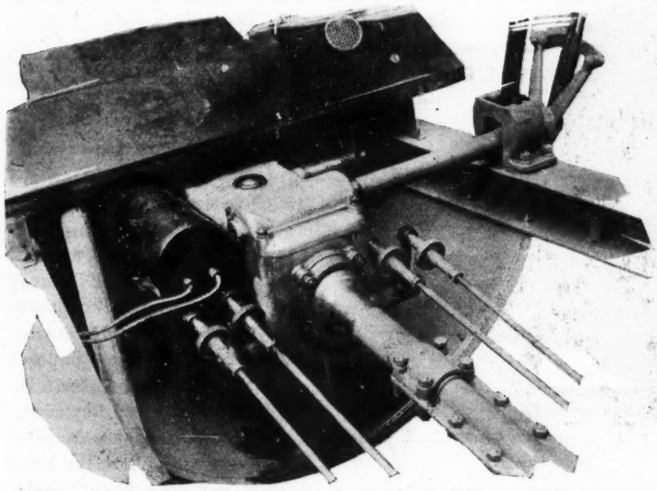
This shows another view of the Fiat post war model engine with cylinders and crankcase in one casting. Note the switchbox on the dash and the integral manifold.

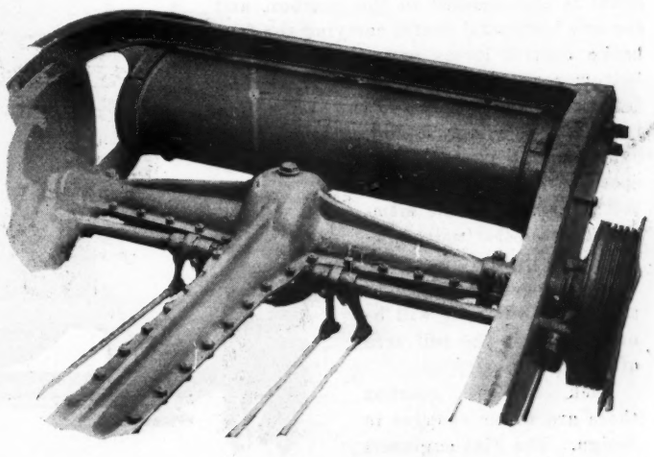
rod bearing. As already mentioned, the crankshaft is carried in two annular ball bearings without the use of a thrust bearing. These bearings are produced in an Italian factory controlled by the Fiat Co. With the adoption of ball bearings the oiling system has had to undergo modifications. It is now of the circulating type with constant level troughs under each connecting rod, the oil being put into circulation by the flywheel, which is provided with oil collectors to assure a very vigorous circulation. This system has been given very close attention and was subjected to very severe tests before being passed as perfect. From the main oil lead there is a by-pass to the gearbox. As the brake and change speed mechanism is combined with the gearbox, everything on the car is automatically oiled with the exception of the steering and spring shackles. According to information received, the first series is going through with very light cast-iron pistons. It is known, however, that all the experimental cars, some of which have been running hard for two years, were tested with aluminum pistons. As the Fiat factory has its own aluminum foundry and uses aluminum-alloy pistons exclusively for aviation engines, this would appear to indicate that they are not convinced this metal has any real superiority over cast iron for a stock car.

Abolishes Cooling Pump

When it is considered that before the war there was not a single Italian car with thermo-syphon cooling, and that few if any thermo-syphon engines kept reasonably cool when tested under conditions of hot plains and continuous mountain climbing in Italy, it is of more than ordinary interest that Fiat should have decided to abolish the water pump. This step has been taken only after a very careful layout and prolonged tests on Mont Cenis passes, 10,000 ft. above sea level, during the hottest months of the year. The radiator is a vertical gilled tube type with a false front quite sufficient to deceive the general public that it is a honeycomb type. This feature has been in use for a considerable time, Fiat having entirely abandoned the honeycomb radiator for all models. The water inlet is at the base of the crankchamber, the pipe passing upwards through the crankchamber into the jackets surrounding the cylinders. The intake has a union nut connection to the engine and a rubber connection to the radiator. There is nothing special in the outlet pipe except a big head of water above the top of the cylinders. A four-blade cast aluminum fan is driven by a Whittle belt from a pulley on the end of the camshaft.

The electric equipment is of the two-unit type. The circular section generator is carried on a base cast with the gearbox and held in position by a flexible steel band and a single nut. It is driven by means of a roller chain from a pinion on the clutch-shaft. During assembly the electric generator is mounted up with the gearbox, and its pinion is inside the aluminum housing. For accessibility and ease of dismounting, there is a detachable cover on this casting which fully exposes the generator pinion and allows the chain to be removed and the generator taken off without disturbing





At the left is the gearbox and brake adjustment of the Fiat. Note that brake control mechanism is inside the gearbox and all pedals are mounted direct to the gearbox. At the right is the Fiat rear axle with double brakes and underslung springs

any other part. Accessibility has been carefully worked out in the new Fiats.

Storage batteries are carried in a metal box bolted to the left-hand frame member, directly opposite the electric generator, allowing of very short length of cable. The front fender and running board are very neatly built around the battery box. The starting motor is mounted on the left-hand side of the basechamber, its pinion meshing with a ring gear cut on the face of the inclosed flywheel. As in the case of the generator, there is a detachable housing around the starting motor driving pinion.

Switchbox Under Hood

On the forward face of the mahogany dash there is an aluminum switchbox with its entire face and walls removable by unscrewing a couple of winged nuts. All electric connections are made from this box, which also carries a special trembler coil patented by the Fiat Co. When the starting switch is pushed in, either by hand or foot, the electric motor is put into motion, its driving pinion is drawn into engagement with the ring gear on the flywheel, and current from the batteries is stepped up through this coil and delivered to the plugs through the magneto distributer. As soon as the engine picks up the electric motor pinion slips out of engagement, and ignition is assured by the magneto only. All electric light wiring is concealed as much as possible. Thus the leads from the switch box are brought down the dash, passed through the horizontal flange of the frame, and carried to plugs in the side of the radiator frame. Head and side lamps are combined. All the electrical equipment on this car is produced in the Fiat shops. It is understood that arrangements are about complete for making the magneto also a Fiat production.

The gearbox and clutch unit, which also comprises one-half of the flywheel housing, contains a multiple disk clutch, lubricated from the engine, and four speeds and reverse with selective change. The great departure from previous practice in this unit is the mounting of the clutch and foot brake shaft in the housing; the accelerator pedal is also secured in the gearbox, and the two horizontal shafts carrying the four brake control levers are mounted in the bottom rear of the gear box. This latter feature is clearly shown in one of the illustrations. To satisfy European taste, right-hand steering is employed and the change speed lever is mounted on the right-hand frame member. The selector rods, however, are inside the gearbox, immediately under the cover, which, it will be noticed, is of the full area of the box.

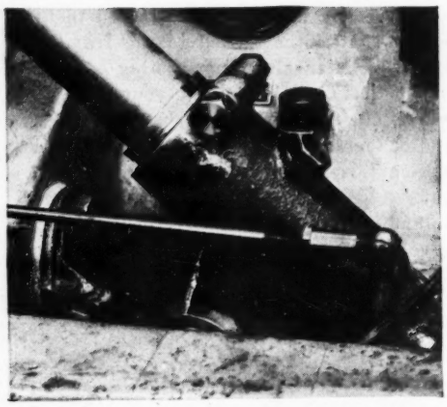
Back of the gearbox there are fewer changes in design. The Fiat engineers have retained their particular design of rear axle and propeller shaft housing comprising two T-shape steel stampings bolted together horizontally. Previously, however, a forged yoke was mounted on the stem of the T and attached by means of a couple of hardened pins in bronze bushings to a heavy transverse frame member. In the new design the yoke has been abolished, also the double transverse frame member at this point, the drive and torque being taken by a spherical head to the rear of the gearbox, this sphere containing the pin type universal which is the only joint in the transmission. Spiral bevel gears are used in the rear axle, and are to be adopted for all Fiat touring car models. Ball and thrust bearings are used throughout the rear axle.

There is no brake on the transmission, the two sets being side by side, operating within ribbed drums on the road wheels. Cast iron liners are used. There is no balancing mechanism for the brakes. The four rods, which are carried alongside the inclosed propeller shaft and guided at their middle length, have ball and socket connection to the brake levers mounted on the transverse shafts within the gearbox housing. Adjustment is too clearly shown in the illustration to need much explanation: it consists of a small wheel at the extremity of the brake rod, right under the floor boards, with a lock nut to prevent slackening off.

The steering layout has undergone no change, but instead of being bolted to the frame member it is now attached to a yoke bolted on the forward face of the right-hand crankcase hanger. This design provides for easy variable inclination, and two inclinations are provided for. Sankey cast steel wheels are the standard equipment, tire sizes being 30 by 4 for the ordinary model, and an increase to 32 by 4 for the colonial model, so as to raise the clearance from 8¼ to 10 in. The gasoline tank, with a capacity of 14 gal., is at the rear under pressure from an air pump driven off the camshaft. Wheelbase is 106 in. and track 49 in. Chassis weight with tires is 1650 lb., and with stock five-passenger body, oil, gas and water, 2314 lb. Maximum speed is 47 m.p.h. and gasoline consumption 21 m.p.g.

Suspension is by semi-elliptic front and rear, the rear springs being underslung and mounted beneath the frame members.

The Fiat post war model has a new type of radiator, which is mounted flush with cross frame member. It is a gilled tube type with false front



The steering gear in the Fiat post war model is bolted to the crankcase hanger

RULES OF ENGLISH OWNERSHIP

New York, May 18—Visitors from England to this country are authority for the statement that motor car sales in England are practically at a stand-still, due to government restrictions concerning the use of gasoline and also with regard to repairing machines.

There is no hope of purchasing touring cars if you live in England. The importation of cars has been prohibited for over a year, and since the supply on hand at that time has been exhausted there is little chance of purchasing. Gasoline is obtainable only under license. These licenses expired April 1, so that since then the car owner cannot obtain gasoline unless he can show that the work in which the car is employed is of national importance. There are very few new cars in the country, and these cannot be sold except with a special permit in each individual case. These permits are only granted after the authorities have made sure that the intending purchaser really needs a car for important work. There is a large handicap with regard to repairs, owing to a shortage of labor, and a permit has to be obtained to have repairs made. It is necessary to show that the use of the car is of national importance before permission to get repairing done is granted.

Notwithstanding this the authorities are as considerate as ever with regard to the general use of motor cars, and things are not so bad in the country as many American daily papers would lead you to infer. It is a known fact, however, that there has been a rule in England for months limiting the amount of fuels motorists may obtain.

The Motor Car Repair Shop

How to Modernize Old Carbureters

NEW ULM, Minn.—Editor MOTOR AGE—One of the most perplexing problems of the garage men and the car owner is the setting of carbureters of the older models which were designed for a better grade of fuel than we are getting now; that is, setting them to meet all conditions. Of course, where the instrument is of too ancient a model, it is best to get a new type, but where the instrument is in good condition, I found that by jacketing the intake manifold with hot exhaust gas, very successful results are obtained. The method of doing this is to take a pipe of some kind and slip over the intake manifold—not necessarily over the whole length as one-half or three quarters will do. It is best at the vertical part. Or where this is impossible to slip on a pipe, take sheet iron and have a pipe made. Where the intake manifold is of cast iron, it can be welded gas-tight at the ends, but where it is of brass or aluminum, it can be made gas-tight by reaming the ends together, then taking babbit and pouring it into the pipe and letting it run down into the ends, thus filling up the holes—the babbit being poured into the holes intended for the inlet and outlet of the gas, as shown in Fig. 2. Then a three-quarter pipe is tapped into the exhaust manifold and connected to the inlet of the manifold sleeve and out again at the other end, and may be tapped back into the exhaust pipe or a separate muffler, or else undesirable noises will be had. This will not only give smoother running at all speeds and eliminate back firing into the carbureter, but will also increase the mileage from 10 to 30 per cent. I find that the proper evaporation of the gasoline by heating the manifold this way offsets its drawback by decreasing the volumetric efficiency, so that even more power is derived than before.—Hugo Fesenmaier.

Home-Made Car Lock

Owatonna, Minn.—Editor MOTOR AGE—In Fig. 1 is shown a simple device for application on the clutch arm whose main purpose is to minimize the possibility of car theft. This little device can be installed on almost any car with a brace, iron bit and a few minutes' time. For anyone who has this objection to offer—"The installation of this device will tend to weaken the clutch arm and thereby place it in danger of breaking," I can reply thus: It has been a recent development to install three springs, evenly over the clutch surface, where formerly one large spring tended to serve the purpose. You have no weight whatever on this clutch arm other than to connect the engine with the driving member and therefore little resistance other than the springs mentioned will fall upon the clutch arm.

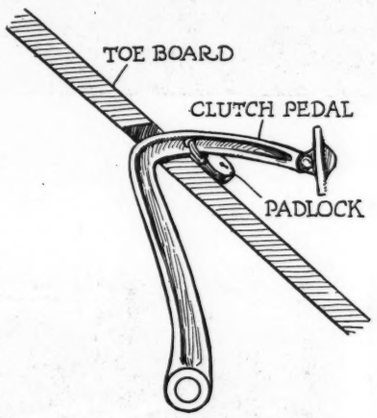


Fig. 1—Another method of locking a car. The padlock holds the clutch engaged

If a good padlock is used there is no danger of anyone running off with your car for when it is used, the clutch cannot be pushed down far enough to disengage.—Mark G. Wynn.

Do You Wipe Your Shoes?

What has become of the old-fashioned motorist who wiped his feet before getting into his car? It seems to the writer that cleanliness in car interiors is getting to be a neglected measure. When cars were less common and consequently more conspicuous, the owner was finicky with the looks of things. He swabbed off his feet in the grass. Now he seems to use the carpets and rubber mats for foot wipers.

It is bad business. Better to use the edge of the running board as a mud scraper, or why not install a mat on the running board?

Care of the Tools

It may appear to be a small matter to some, but the really mechanically-inclined motorist never would think of using any of the tool equipment of his machine without properly packing and stowing it away again afterward. It often happens that a tool is wanted in a hurry, and if the whole tool equipment has to be taken out and rummaged through to find the particular article wanted, much time and needless energy is expended. Tool kits, compartments for special devices and pockets are provided in most of the car nowadays. Much trouble can be saved in the end by a little attention to this detail, particularly when tools are put away.

Careful motorists wrap their good tools, such as wrenches and drills in oiled cloth before stowing them away in the tool compartments, and this does much to prevent them from becoming rusted and unusuable. A case recently noted brought home forcibly the argument against carelessness with tools. On finding a loose nut the only wrench in the car was searched for. On finding it, after much hunting through the miscellaneous collection of tools thrown hastily into the tool box, the screw portion was found to be broken away from the sliding part due to some heavier article such as the jack or a tire iron having struck against it.

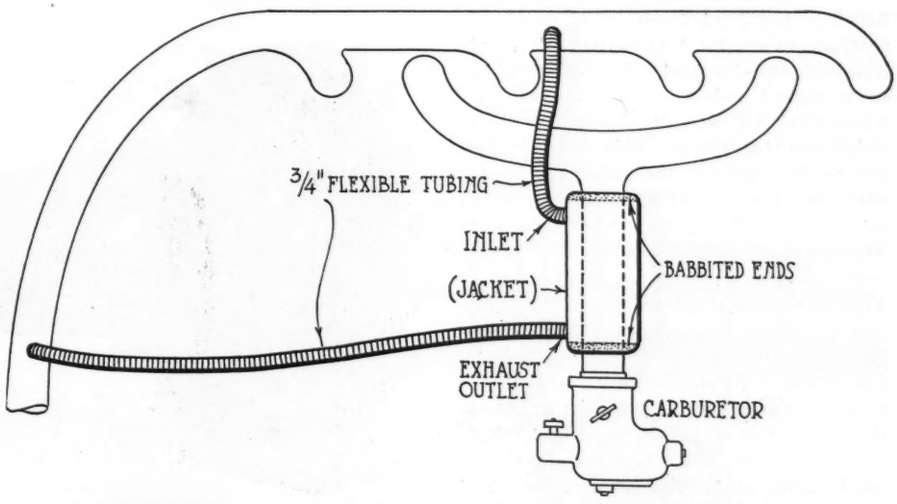
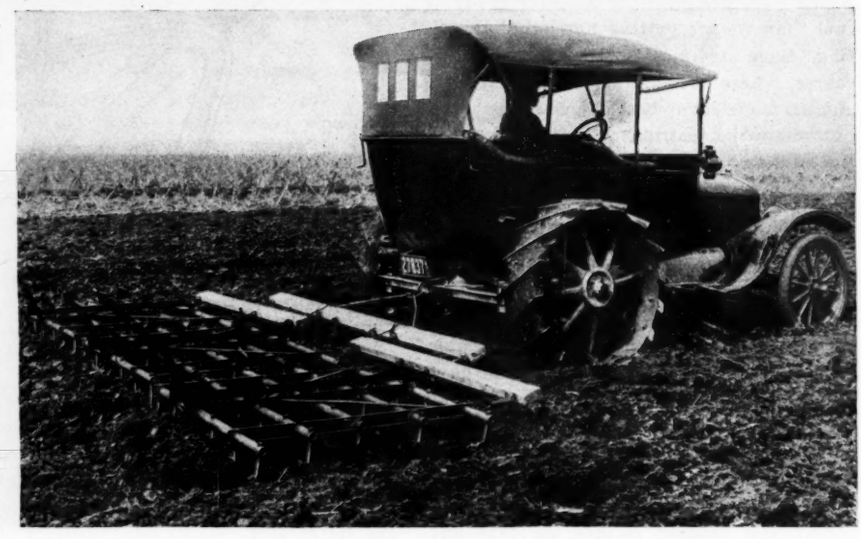


Fig. 2—Installation which may be added to the old carburetion system to take care of the present low grade of gasoline



Three views of UniTractor in operation, showing the diversity of work it will accomplish

Passenger Car or Tractor at Will

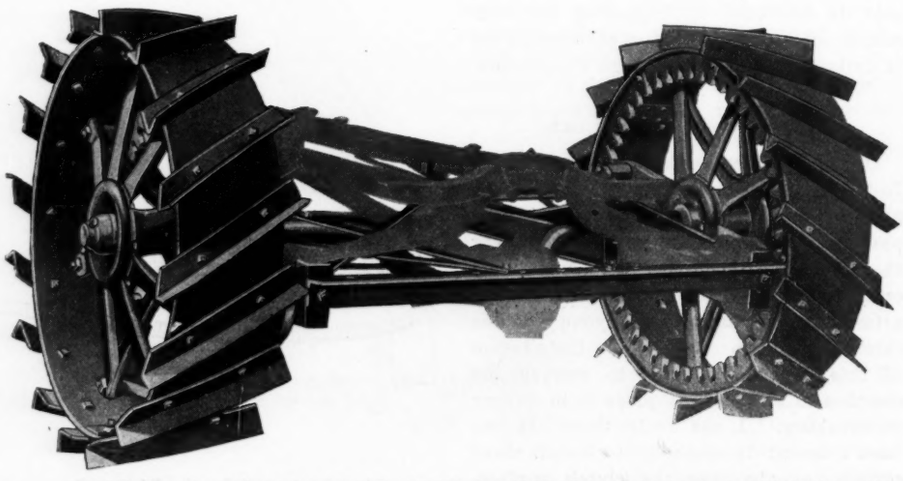
THE Ford car with the UniTractor attached can haul a three-horse load to market at 3 m.p.h. and come home without the load at 20 m.p.h. It can be driven to the field as a passenger car and used all day in the field as a tractor, then home again as a passenger car.

The rear fenders, running boards and rear wheels are removed. No holes are bored in the Ford frame or in any other part of the car for that matter. The side members, tubular-steel axle and draw bar are attached and remain on the car permanently. All this attachment is said to weigh less than 100 lb. This assembly does not project beyond the sides of the car with the exception of the drawbar, which is well out of the way when the Ford wheels are replaced.

To install the tractor assembly the Ford wheel is removed and replaced by a pinion carrier which is equipped with a brake drum and five hardened-steel roller pinions. The UniTractor wheel is equipped with angle iron lugs of 2-in. size which are shaped to the curve of the wheel. This shaping is done in a fashion to eliminate rough riding on hard surfaces. The wheel has as a part of it an internal gear in eight segments and made of chilled gray iron. The chilling process renders the gear teeth very hard. This gear when meshed with the pinion gives a gear reduction of 8 to 1. At 3 m.p.h. the engine is turning 970 r.p.m., which is a safe speed for continuous duty.

Saying it in other words, at an engine speed equivalent to 20 m.p.h. in the standard Ford assembly the tractor is working at the rate of 2½ m.p.h., or at 24 miles, at 3 m.p.h.

Once the superstructure is attached it is a matter of changing the rear wheels of the Ford for the pinion carrier, and attaching the tractor wheels to convert the car into a tractor. Then to convert the car back to a passenger vehicle again the inverse operation is observed. The fenders



The UniTractor attached to the Ford. The tractor wheels may be removed and the drive pinions replaced by the Ford wheels, making a standard passenger car

Ferguson truck unit for attachment to Ford chassis

and running boards can be replaced with the tractor superstructure in place, effectively hiding the latter.

The UniTractor is manufactured complete in the shops of the UniTractor Co., Chicago. The complete equipment consists of wheels, gears, roller pinions, the axle, a drawbar, a frame, and a circulating pump. It is in the axle that quick convertibility from car to tractor and vice versa lies. The bull wheels of the UniTractor run on a 1 13/16-in. solid cold-rolled steel axle which fits and is rigidly keyed and bolted into a tubular steel permanent axle. By the removal of one bolt the solid axle and wheel are almost instantly removable. The permanent tubular axle once installed, remains on the car, out of sight and ready for use when needed.

The circulating pump is to give a positive cooling system as an assistance to the standard Ford system. It is a simple unit which is bolted onto the engine without alterations being necessary.

Fruehauf Trailers—Ferguson Trucks

THE Fruehauf trailers, built by the Fruehauf Trailer Co., Detroit, increase the load-haul capacity of any truck about four times. Furthermore, by the use of three trailers to each truck, one trailer is being loaded, one being hauled, and one being unloaded at the same time. This keeps the truck busy.

In fact, the Fruehauf trailer is a semi-trailer, and the truck is converted into a tractor. This is done by attaching a Martin Rocking Fifth Wheel on the rear of the truck. If an old truck is used, the original body is removed.

The Martin Fifth Wheel is a device that makes it possible for all six wheels of the truck and the trailer to conform to the unevenness of the road. A vertical hinged member is attached to the truck, and carries a pivoted platform that permits the trailer to either rock up and down on the truck, or to follow behind in its wheel tracks.

Two standard models of the trailer are made at present. One is the 6-ton model, adaptable to 1, 1½, and 2-ton trucks, and the other is a 4-ton model to be used in connection with Ford converted trucks. Special models with special bodies may be made for any purpose.

The frame of the 6-ton model is 6 in. channel steel, 16 ft. long and 6 ft. wide. It is equipped with a stake body, the stakes being 32 in. high.

In all models, the wheels are so placed that the largest part of the load is carried by the trailer. About one-third of the load rests on the rear end of the truck, this being sufficient to give traction under practically every condition.

At present, when three trailers are used with one truck, the front end of the trailer is raised from the truck by jacks, when making a change. On some trucks a hoist driven by the truck engine is used. Special jacks are now being designed that will be part of the standard equipment of each trailer, and will facilitate the trailer change.

FERGUSON TRUCK UNIT

The Ferguson truck unit for converting Ford cars into trucks sells for $350 ready to attach. It is the double-chain drive type in which the Ford axle is hugged against the bottom of the frame and used as a jackshaft. The unit is so designed that 90 per cent of the load is carried on the rear dead axle with its heavy truck wheels.

The frame is 14 ft. long and is made of heat-treated steel, hot riveted, and reaches up to the Ford dash. This frame is strongly reinforced. There are heavy gusset plates and corner irons at the rear of the frame, also a heavy I-beam over the rear axle to which is bolted the cross spring through drilled holes.

The rear axle is 2½ by 1⅞ in. drop-forged and heat-treated with a carrying capacity of 1½ tons. The side springs are 2 in. wide and 44 in. long. The heavy truck wheels have twelve 2-in. spokes and are equipped with solid Firestone tires. This unit is a product of the Blount Carriage and Buggy Co., Atlanta, Ga.

HOLLEY VAPORIZERS AT COST

Detroit, May 21—The Holley Bros. Co. is arranging to establish a plant at Coventry, England, where it will manufacture kerosene vaporizers for Ford tractors at cost and without profit for the English government.

Arthur Dugrey, a member of the company, arrived at Coventry several days ago and is now completing the arrangements which provide for production within the next 60 days.

Holley Bros Co. are making this move in harmony with the Ford Motor Co. which is now furnishing men, tools and tractors to the British government at cost.

Fruehauf trailer attached to Ford truck unit. The Martin rocking fifth wheel is employed

Heavy Components in Indestructible

Pressed-steel Wheels for Strength

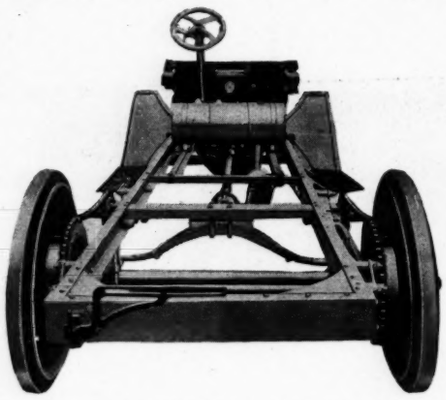
HEAVY and sturdy components, many of which are found to be original in Ford truck attachments, give a large factor of safety in the Indestructible truck attachment of the Indestructible Truck Co., Indianapolis, Ind.

In its whole the attachment follows the usual method of an auxiliary frame extending from the radiator to a point more than 5 ft. beyond the rear of the Ford frame. The rear axle of the Ford becomes a jackshaft, and from this power is transmitted by double chain to the rear axle, giving a 7½ to 1 gear ratio.

One of the evidently unique features is found in the 34 by 3½ in. pressed-steel wheels. These are each made of two plates of cold-rolled, deep-drawn steel, stamped with accuracy and reamed to a driving fit over the hub centers. The rims are shrunk on hot, and the plates are riveted at each side of the rim. Solid rubber tires complete the assembly. It is claimed that these wheels will withhold 50 per cent more load than an ordinary artillery-type wheel.

The rear axle is 2¼ in. in diameter, designed for a 3000-lb. load. Timken heavy-duty bearings of 2-in. size are employed.

The radius rods are especially interesting. Connecting the combination axle casing and brake supports with the jackshaft hangers on the frame, they were designed in conformance with standard truck engineering practice, to relieve the springs from power-driving thrusts and to hold the rear axle in perfect alignment between the spring shackles. An adjustable swivel to the jackshaft is provided at one end, and at the other a yoke and pin swivel fits over



Rear view of Indestructible assembly, showing layout of chain drive from Ford axle, which is used as jackshaft

the rear axle to prevent twisting strains on the jackshaft or rear axle. The brake bands are carried on independent brackets, and there is no chance for the movement of the flexible radius rods to cause binding at this point.

Springs are 48-in. semi-elliptic on the rear with eleven leaves of 2-in. face. A helper spring 2-in. wide by 30-in. long is also provided over the rear axle to relieve the tension on the side springs when traveling over rough roads under load.

The wheelbase is 126-in. when the assembly is attached to the Ford, which affords a loading space of from 9 ft. 6 in. to 10 ft. The price is $350.

BELL ENGINE DETACHABLE HEAD

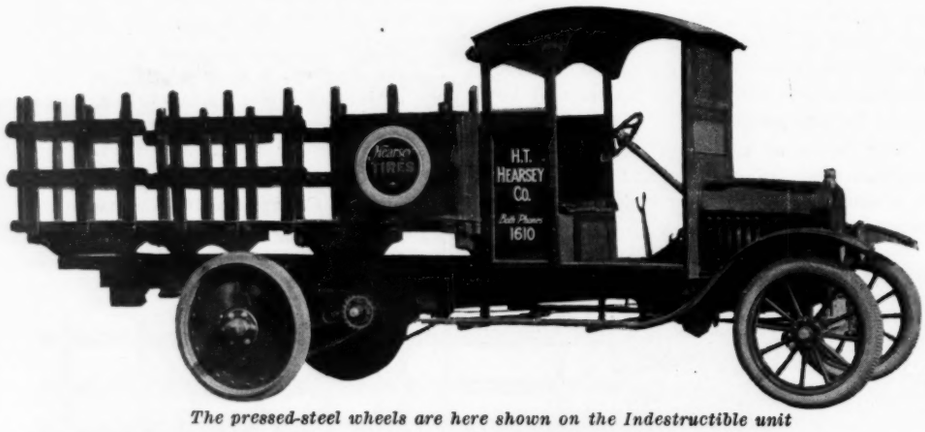
New York, May 21—A four-cylinder, 35-hp. car selling at $875 and made up into a five-passenger touring car and a four-passenger roadster, styled Model 17, has been brought out by the Bell Motor Car Co., York, Pa. The new model is featured by its 3½ by 5 engine which is cast in block with a detachable head.

Lubrication is by constant level splash with plunger pump operated by a special eccentric on the camshaft. Valves are 1⅝ in. in diameter with 45 deg. seats, with the head of cast iron electrically welded to a high carbon steel stem. There is a 1⅞ in. free gas opening with a mushroom type lifter, hardened and ground. The crankshaft is of 40-50 carbon steel alloy, double heat treated, drop forged and balanced, while the camshaft is of 1 in. diameter, case hardened. Atwater Kent ignition thermo-syphon cooling and Zenith carbureter are used.

The Bell gearset is of Covert make, three speeds forward and one reverse. The Borg & Beck single dry disk 8-in. clutch is used. Control levers consist of left-hand drive, center control at the side of the emergency lever. The Bell company is using the Dyneto, two-unit system by means of the Bendix drive with the Willard Storage battery.

A pressed steel 20-30 carbon steel channel section 4½ in. high frame is used. The upper half of the rear spring bracket is integral. There are three cross members, including a front member under the radiator. The front axle is of I-beam design, while the rear axle is full floating, with inspection plate at the rear, and annular bearings. The wheelbase and trend are 112 and 56 in. respectively.

The steering gear consists of the thread screw type, made by the Lavine company. It is irreversible and adjustable for wear. Wood artillery 31 by 4 type of wheels are used. Brakes are external contracting for service, and internal expanding for emergency. Both brakes are 12 in. in diameter with a 2-in. face.



The pressed-steel wheels are here shown on the Indestructible unit

The sturdy radius-rod assembly of the Indestructible attachment for converting a Ford car into a 1½-ton truck

STEAMOTOR COMPANY FORMED

Chicago, May 21—The Steamotor Truck Co., with a capital of $3,000,000, has been formed in this city to manufacture steam motor trucks using the Doble equipment. The company has been licensed under the Abner Doble patents. Manufacturing arrangements have been made on a plan contemplating the production of 150 trucks per day.

PEERLESS BREAKS TRUCK RECORDS

Cleveland, Ohio, May 18—The Peerless Motor Car Co. is making record shipments of trucks, and has shipped an average of eighty trucks a week since the first of January.

Sturdy Frame in Truckmobile Unit

Side Springs Between Frame and Axle

ONE of the simplest of the truck units on the market for converting Ford cars into a truck is the Truckmobile, manufactured by the Commercial Truckmobile, Chicago.

The Truckmobile has several features that discriminate it from many other attachments. It has a long wheelbase, 133 in., also a wide frame, 41½ in. These two features, it is claimed by the manufacturers, make for greater loading space, easier riding and steering qualities, as well as less side sway of load.

The manufacturers lay great stress on the placement and suspension of the side springs on the unit, for the springs are not suspended from the side of the frame as in other units but directly from the under side of the frame. It is claimed that in carrying a load or weight the carrying power should be immediately below the load and not to one side of it. In method of interposing its side springs between frame and rear axle the Truckmobile is unique. This practice gives easier riding quality and reduces side sway.

The Ford rear axle is used as a jackshaft. The axle is not altered except that the wheels are replaced by a specially designed Bell sprocket. This sprocket keys onto the jackshaft the same as any rear Ford wheel keys onto its axle and can be attached in a few moments. Naturally the Truckmobile method of using the Ford rear axle as a jackshaft does not require taking down of the rear housing or cutting of the rear axle itself. Therefore it permits of re-converting the Ford back into a pleasure car if desired by the owner.

While the Truckmobile is rated as a 1-ton truck it is capable of carrying a 50 per cent overload so it is claimed. It is the intention to turn out 4000 to 5000 units this year. The price is $350.

Rear of Truckmobile unit, showing frame construction with reinforcements at corners

comprising the four-cylinder engine, three-speed transmission and worm drive rear axle. The radiator is carried on a forward extension of the crankcase immediately beneath which is a pivot attached to the center of the front axle, which is of the motor car type.

Designed much along the lines of the model T, the engine is very much larger, and in every way more substantial. The crankshaft has a wide center bearing, and the transmission is proportionately bigger than the Ford car gearset. Thermo-syphon circulation is used, and the radiator is a massive truck pattern with cast tanks. The engine is 4 by 5 in., and has the regular flywheel magneto for ignition. The transmission is quite different from the Ford system, none of the three forward speeds being direct. A disk clutch is used, and the three ratios are obtained through spur gears controlled by a shift lever of the conventional kind. Overall dimensions are in length 8 ft., height 4 ft. 6 in. and width 5 ft. 6 in.

As to the capacity of the machine, a British report states that most of the experimental machines, of which several have been shipped over, are drawing two plows, the furrow varying in depth from 9 to 11 in. and that the rate of operation averages 3 hr. to the acre. On some of the experimental machines the Holley kerosene carbureter, described in MOTOR AGE for May 3, is being used.

ITALY TO SUBSIDIZE TRACTORS

New York, May 18—The Italian Ministry of Agriculture has issued a notice fixing rules whereby agricultural bodies and societies in Italy may obtain a government contribution toward the cost of acquiring tractors for mechanical plowing. The grant will be conceded to these bodies up to 30 per cent of the total cost. In the case of private persons the grant will not exceed 20 per cent.

FORD TRACTOR SPECIFICATIONS

Considerable mystery has enveloped the Ford tractor, and it appears at present that so far as manufacture is concerned, as much, if not more, has been done toward the development of European production than American.

The design, however, is definitely in the final stage. There is one main unit, this

NO PACKARD AIRPLANES

Detroit, Mich., May 18—Stories regarding the airplane activities of the Packard Motor Car Co. have been circulated in various sources, the latest being of a supposed high speed plane that the Packard company was said to build. MOTOR AGE is able to state authoritatively that the Packard Motor Car Co. has given up the idea of making planes, or even flights, as it is going to turn its entire attention in this department to the manufacture of airplane engines. The government officials will do the flying experimental work themselves, probably at the aviation school at Miami Beach, Florida.

The Truckmobile has a wheelbase of 133 in. with 1½-ton capacity. It may be attached to the Ford without cutting or fitting

The Accessory Corner

Easyon Chains

IN the Easyon chain the cross chains are fastened individually to the spokes instead of to side chains. In this way it can be attached to the wheel without jacking up. The fasteners are covered with leather to prevent marring of the paint, and the cross chains are smooth and round next to the tire so as not to injure the rubber. Easyon chains are packed a set of eight in a bag, four for each rear wheel, and are made in three sizes, small for tires 3 by 3½, medium for 4 by 4½ and large for 5 by 5½. Prices, $3, $4 and $5, respectively—Woodworth Mfg. Corp., Niagara Falls, N. Y.

G. A. C. Accelerator Foot Rest

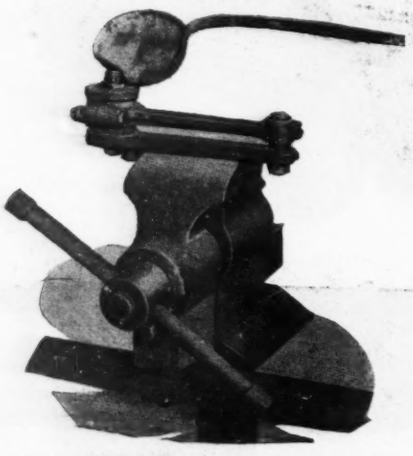
The rest is in the form of a heel support which is freely suspended so that it may be moved forward or backward. Its use is said to give a smooth action on the accelerator and prevent chocking of the engine on rough roads, wearing of the heel of the shoe, wearing holes in the mat, and wearying of the leg. Price, $1.25. The General Appliance Co., Boston, Mass.

Draver Wheel and Tire Carrier

This patent wheel carrier consists of a flexible cover for the casing and a pair of convex plates between which the cover, tire and wheel are clamped by the nut on the supporting spindle. Removing the nut instantly releases the end plate and the wheel. It is said to be dust, water, rattle and thief proof. The E. R. Draver Co., Richmond, Ind.

Dyer Re-Babbitting Jig

This jig is for rebabbitting Ford connecting rods. It is held in an ordinary vise, and it is only necessary to remove one nut and the cap to place the rod in position for pouring the babbitt. The cost of the jig is $1.50. The Dyer reamer for connecting rods and main bearings reams the bearings true with the face of the block. It does away with scraping the bearings by hand, and is said to permit of much more accurate work. It has two adjustable guides to line the main bearings perfectly true. The reamers are carried in assorted sizes and sell for $3.50. The G. H. Dyer Co., Cambridge, Mass.



Dyer rebabbitting jig for Ford connecting rod bearings. The operation of adjusting the jig is very simple

Easy-On chains, which are fastened individually to the spokes. The fasteners are covered with leather to prevent marring of the paint

McKiernan's camper's home that can be packed compactly and carried on the running board

Dow Flag Holders

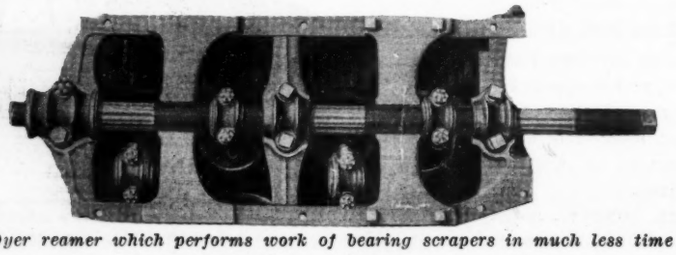
This is a flag holder which is designed to fasten to the radiator cap. It may be easily adjusted to fit any size or shape of cap. The price of a holder for two flags is 45 cents, for one flag 35 cents. This price does not include flags. Dow Wire & Iron Works, Louisville, Ky.

Neverout Flag Holders

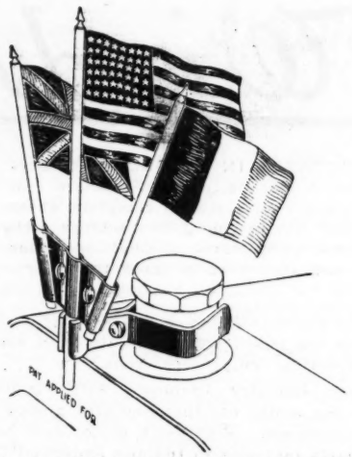
This flag holder attaches to the radiator filler cap. It takes various sizes of staffs for flags or club pennants. It is made of metal, strong, and black enameled. It is made to hold one or three flags, Rose Mfg. Co., Philadelphia, Pa.

McKiernan's Camper's Home

A complete camping equipment that can be carried on the running board of the car.



Dyer reamer which performs work of bearing scrapers in much less time



A Neverout flag holder carrying the British, American and French colors

It includes a full-sized, two-deck bed, big enough for four people; two sets of stout woven wire bed springs; two mats for the beds, a table big enough to serve six people, two camp stools, a wall tent made of 8-oz. army shelter tent duck; end poles, ridge pole, guy ropes, stakes and pins. The complete outfit weighs approximately 125 lb. and when folded it measures 11 by 18 by 48 in. Camper's Compact Outfitting Co., Chicago, Ill.

Old Glory Flag and Holder

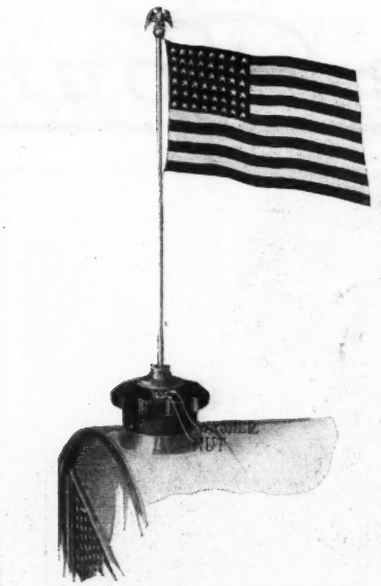
The staff is of metal with a metal base tipped by a metal eagle. The flag is made of good quality silk with the edges hemmed. It is steel eyeletted and attached to the metal rod with wires. The rod is 11-in. long over all and is nickeled. The lower end passes through the radiator cap, is threaded and comes equipped with nut and washer. The eagle surmounting the staff is gold plated. The suggested list price is 66 cents. The Art Metal Works, Newark, New Jersey.

MOTOR CAR DEATHS INCREASE

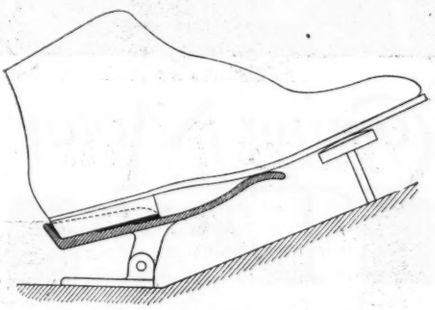
New York, May 18—The mortality from motor car accidents and injuries showed by far the largest increase in the percentage for any of the specified causes of accidental mortality last year, according to the report recently issued by the Metropolitan from statistics of 9,000,000 policy holders. The motor car accidents were responsible for three-fifths of the increase in the total accident rate in 1916. The rate last year was 8.8 per 100,000 as compared with 5.7 per 100,000 in 1915.

HIGRADE TRUCKS SOON

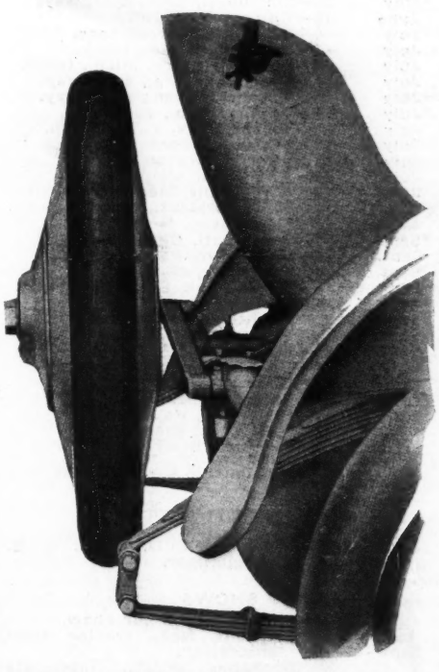
Grand Rapids, Mich., May 18—The Higrade Motors Co., which was organized early this year, will soon commence steady production of its Higrade trucks. The company has purchased a tract of land in this city, and will erect a factory to be completed early in September. Arrangements are being made to put the first trucks on the market about July 20. The first thousand will be made in the experimental shops at Harbor Springs, Mich.



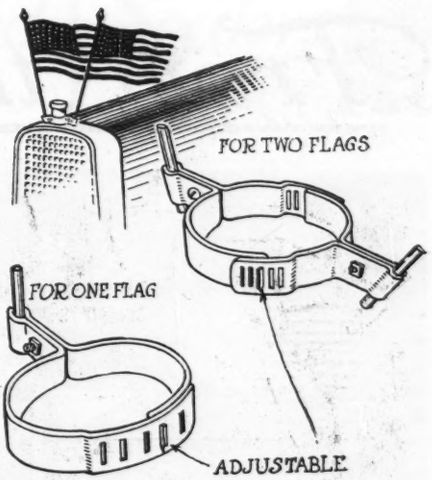
Old Glory flag and holder. The standard is nickeled steel and the eagle gold plated. The flag is hemmed to prevent fraying



G. A. C. accelerator foot rest. It saves the shoe and allows even pressure on the throttle pedal



Draver wheel and tire holder. Locks the wheel and protects all parts from dust



Dow adjustable flag holders made to carry one or two flags

The company is manufacturing a ½-ton truck. The chassis weighs 2310 lbs., and with the heavy express body and full top the weight is approximately 2800 lbs. The equipment includes standard 32 by 4 tires. The wheelbase is 115 in., with 102 by 48 floor space, clear of the driver's seat. The wagon bed floor is 30 in. from the ground. The engine is a Wisconsin 3¼ by 5 four-cylinder, equipped with a Bosch high tension, ignition, lighting and starting outfit. Sheldon worm-drive axles and spring suspension, Spicer direct drive; Borg & Beck disk clutch; Lavine semi-irreversible worm steering gear; Fedder cellular radiator, and Parish frame members constitute the most important units. The car has a turning radius of 22 ft. The price, which has not yet been settled, will be less than $1,600.

MAXWELL ECONOMY WEDNESDAY

Chicago, May 19—Dealers in this territory have made elaborate preparations to take part in the Maxwell dealers' economy contest which will be staged Wednesday throughout the United States and Canada. Dealers everywhere will borrow used Maxwells from their owners, equip each with a tank containing 1 gal. of gasoline and test their power in driving the cars as far as possible on that amount of fuel. A championship cup and $5,000 are the prizes.

ENGER SALE POSTPONED

Chicago, May 22—Sale of the assets of the Enger Motor Car Co., which was to have been auctioned May 24-25 at Cincinnati, Ohio, by Samuel L. Winternitz & Co., Chicago, has been postponed to June 5. Everything is to be sold, including the real estate, and the inventory value is given as $500,000. The plant may be inspected on and after June 1, and it is expected the sale will be consummated in two days. The tools and machinery of each department will be sold in separate parcels.

From the Four Winds

DICTATES IN CLOSED CAR—Gordon J. Gordon, a San Francisco real estate man, used to complain of an hour lost in riding to his office. He doesn't any more. A Chalmers sedan and stenographer save the hour

MILLINERS Pledge Ambulances—Forty ambulances, completely equipped, have been pledged by members of the Eastern Millinery Association. These cars are to be sent to France in two units of twenty cars each and are to be designated as the American Ambulance Millinery Branch.

Increase in Maryland's Cars—The report of the motor commissioner in Maryland for the fiscal year, just submitted, shows gross receipts of $711,503.48, more than $200,000 above the previous year. When the office was established in 1910 the first year showed a little more than $40,000 receipts.

Will Build Utah Road—The 22 miles across the flats of the desert in Tooele county on the Lincoln highway will be built as soon as the weather permits. H. B. Joy, president of the Lincoln Highway Association, has paid the first installment of $7,500 of the necessary money into the Utah State National Bank. The estimated cost is $300,000, which will be furnished by the association and various large motor companies.

Club to Motor to Meet—The special "On-to-St. Louis" committee of the Advertising Club of Louisville, Ky., has decided the club should go to the convention of the Associated Advertising Clubs of the World, June 3-7, in motor cars. An effort will be made to enlist the services of fifty or more machines, some of which already have been promised. The start will be made from Louisville June 2, and the night will be spent in Vincennes, Ind. The party expects to arrive in St. Louis the next afternoon or night.

Louisville Club Organizes Services—Organization of a motorists' reserve to perform such services as may be desired within a 100-mile radius of Louisville has been proposed by the Louisville Automobile Club as a part of the defense scheme of the Council of National Defense. Volunteer applicants already have been received. The organization will be known as the Motor Car Reserve of Louisville. It will consist of owners of motor cars who will agree to furnish their cars, with drivers, to transport troops and munitions of war within a radius of 100 miles of Louisville, for the preservation of law and order and to protect the public welfare in times of emergency during the present crisis.

Motor Industry Indiana's Fifth—Indiana ranks the motor car industry fifth among its big businesses. Eighty-six motor car, body and parts factories in Indiana employed 7219 wage earners in 1914, paid a total of $5,027,000 in wages, spent $18,830,000 for materials and put out products having a total value of $29,390,000 during the year, according to governmental census figures.

Kills Car Thief; Acquitted—A St. Louis, Mo., owner saw his machine being driven away and gave pursuit in his brother's car. After a chase he overtook his machine and demanded that the men surrender it. They attempted to drive away, and he shot one dead, mortally wounded another and held two prisoners for the police. He was acquitted by a coroner's jury.

Benefit Run for Red Cross—When George A. Ellis, state commissioner of the Motorcycle Federation, planned a run for June 10 between Yonkers and Albany and return on both sides of the Hudson river, he decided to call it the Capital Run. Since then he has joined the staff of the United States Tire Co., and has not only decided to rename it the Usco run in honor of the company's product but will make it a sociability rather than an endurance affair. The proceeds will be donated to the American Red Cross Society.

To Open Scenic Route—More than $700,000 will be spent by the United States Forest Service and Greenlee county in the construction of a highway through the Apache National forest between Clifton and Springerville on the Ocean-to-Ocean highway. The new road will traverse one of the most scenic sections of the Southwest and will open a direct route between El Paso and Lordsburg, N. M., and the Grand Canyon of Arizona. Some of the finest camping sites in western America are located in the Apache National forest.

Four Years for Theft—Expressing the determination that only by heavy penalties can the motor car thief be put out of business, Judge A. C. Backus, of the Municipal Court, at Milwaukee, Wis., sentenced Otto Glaesser, seventeen years old, to serve four years in the state reformatory on his plea of guilty to the charge of stealing the private car of H. W. Bonnell, manager of the Mitchell Automobile Co. Glaesser was apprehended at Kenosha, 37 miles away. It was proved he was responsible for the theft of four other cars in recent weeks. A companion, Frank Mrotek, eighteen years old, was placed on probation for two years.

$5,000,000 for Wisconsin Roads—The Wisconsin legislature has passed the new state aid highway law, appropriating $5,000,000 to assist towns and counties in the construction of 5,000 miles of trunk highways to connect every county seat and important town in Wisconsin. The law contains a provision which fixes the annual registration fee for motor cars at $10, instead of $5 as at present, and the proceeds are appropriated to the highway fund.

Coming Motor Events

CONTESTS

—1917—

May	30	Newark, N. J., track.
May	30	Washington, D. C., track.
May	30	Uniontown, Pa., speedway.
*May	30	Cincinnati, Ohio, speedway.
June	16	Chicago, speedway.
July	4	Visalia, Cal., road race.
July	4	Spokane, Wash., track.
July	4	Benton Harbor, Mich., track.
July	4	Uniontown, Pa., speedway.
July	4	Tacoma, Wash., speedway.
*July	4	Omaha, Neb., speedway.
July	14	Rochester, N. Y., hillclimb.
July	15	Missoula, Mont., track.
July	17-19	Intercity Reliability.
July	22	Anaconda, Mont., track.
July	29	Great Falls, Mont., track.
Aug.	5	Billings, Mont., track.
Aug.	17	Flemington, N. J., track.
*Sept.	3	Cincinnati, Ohio, speedway.
Sept.	3	Uniontown, Pa., speedway.
Sept.	6	Red Bank, N. J., track.
Sept.	8	Pike's Peak, Colo., hill climb.
*Sept.	15	Providence, R. I. speedway.
Sept.	22	Allentown, Pa., track.
Sept.	28	Trenton, N. J., track.
*Sept.	29	New York, speedway.
Oct.	6	Uniontown, Pa., speedway.
Oct.	6	Danbury, Conn., track.
*Oct.	13	Chicago, speedway.
Oct.	13	Richmond, Va., track.
Oct.	27	New York, speedway.

* A. A. A. Championship Award Event.

MEETINGS

June	25-26	Washington, D. C., S. A. E. midsummer.

SHOWS

June	20-27	Montreal used car show.
Aug.	6-18	Fremont, Neb., tractor demonstration.
Sept.	9-15	Spokane, Wash., Interstate fair.
Sept.	2- 9	Milwaukee show, State Park fair, West Allis.
Oct	13-28	Dallas, Tex., state fair.

Among the Makers and Dealers

ELGIN Motor to Build—The Elgin Motor Corp. will build a one-story addition, 74 by 240 ft., costing $40,000.

Chandler Shipments Increase—The Chandler Motor Car Co. is shipping cars at the rate of over 28,000 cars a year. During the week of April 14 the company made a record shipment of 618 cars. Last year, total shipments were 13,073 cars.

New Gear Company Builds—The Campbell Transmission Co. has been organized and is now building at Buchanan, Mich. The officers of the company are: L. L. Campbell, president; L. J. Campbell, vice-president and chief engineer, and C. B. Heineman, secretary. The gear is for any direct drive machinery and is covered by patents.

Indiana Dealers Plan Central Market—A meeting of dealers was held at Fort Wayne, Ind., last week, at which plans were formulated for the establishing of a used car market. According to the plans all dealers would place their used cars in one building and select a competent man to have charge of the establishment.

American Building Factory—The American Motor Truck Co. has purchased a factory plant for truck manufacture and has commenced the installation of machinery and material. The new factory is a one-story brick structure with 40,000 sq. ft. of floor space. The truck is made of standard materials, including the Continental engine, and is manufactured in 2, 3½ and 5 ton models, all of which sell for more than $3,000 each.

Sunderman to Open Foundry—The Sunderman Corp., maker of the Sunderman vacuum carbureter, reports the company's business this year will amount to approximately 200,000 carbureters. At present the output is limited to the amount of brass castings that can be purchased already made, which does not meet the demand. The company recently received an order from Russia and does business with New Zealand, Canada, Hawaii and Cuba.

Ajax Declares Dividend—The Ajax Rubber Co. has declared a quarterly dividend of $1.50 per share, placing the stock on a $6 per share per annum basis. The last dividend declared by the company three months ago was $1.25 a share. The dividend is payable June 15 to stock of record May 31. It is stated that earnings of the combined company, including the Racine Rubber Co., for the first quarter of 1917 were far in excess of any other quarter in the history of the organization.

Metz Promotes Employees—The Metz Co., Waltham, Mass., has made several changes in its sales organization. Edwin Metz, retail sales manager, has been promoted to be assistant to the president. E. L. Bunker, Maine manager, will head local sales, with C. I. Pickens as office manager of the retail branch. The Maine territory will be under A. S. Rowe, who comes from the managership of the western Pennsylvania district. J. V. Gormley, state manager of Georgia, has been recalled to the factory and will be with the local retail branch. J. B. Ramm, formerly at Birmingham, Ala., as state manager for that district, will handle both Georgia and Alabama in the future.

Quickwork Takes Over Company—The Quickwork Co. has been organized to take over and operate the machinery business of H. Collier Smith, of Detroit. This business includes the manufacture of machinery for working plate and sheet metal for motor car parts. Mr. Smith retains the controlling interest and will have active charge of the operations of the company, which is capitalized at $400,000. Officers include, H. Collier Smith, president and general manager; H. E. Groves, vice-president; A. F. Smith, secretary and treasurer; W. J. O'Leary, production manager; W. W. Prigg, director of sales, and Harry G. Smith, head of engineering department.

HOW THE MOTOR TRUCK CAN AID—Plowed ground has no terror for this 3-ton F-W-D truck with its 3-ton trailer when helping increase food production

Savage Speeds Production—The Savage Tire Co., San Diego, Cal., is now working two shifts and will soon add a third, which will increase its output to 1000 tires a day.

Overland Tire Buys Land—The Overland Tire Co., Newark, N. J., recently incorporated with a capital of $100,000, has acquired property for a plant. The initial operations will include a floor space of about 40,000 sq. ft. J. A. Whitman, of Grantwood, N. J., is president.

Mason Tire Increases Capital—The Mason Tire & Rubber Co. has increased its capital from $1,000,000 to $3,000,000, the new capital to consist of $2,000,000 in 7 per cent preferred and $1,000,000 in common. The plant now has a capacity of more than 500 tires a day, and the increase in capital is to raise the capacity to 1500 a day within the next year and provide additional working capital.

Vim Company Raises Wages—The Vim Motor Truck Co. has announced an increase of 10 per cent in the wages of its employees. The increase affects the Philadelphia and Pittsburgh plants. A reduction of 2½ hrs. a week in working time also was made. The men will be paid their former weekly wage for the shorter hours, and the 10 per cent will be in addition.

Expects $3,000,000 Profits—Net profits in the March quarters of the Fisk Rubber Co. are understood to have been sufficient to cover the entire year's 7 per cent dividend on the two issues of first preferred, aggregating $9,400,000. In addition, there was a substantial balance left toward the dividend on the $4,500,000 second preferred. Earnings of more than $3,000,000 net in 1917 are expected. These are compared with actual profits of $1,836,829 in the fiscal year ending Dec. 31, last.

Pierce-Arrow Elects—The Pierce-Arrow Motor Car Co. has elected the following officers: President, Charles J. Clifton; vice-presidents, Henry May and W. J. Foss; secretary, L. H. Gardner, and treasurer, W. C. Wrye.

Wald Mfg. Co. Adds—The Wald Mfg. Co., Sheboygan, Wis., which makes motor car and cycle specialties, has awarded contracts for the erection of a one-story factory addition, 60 by 100 ft., which will enable it to increase its capacity about 50 per cent within the next sixty days.

Kissel Places Mexican Agency—Estera-Ruiz & Co., New York, have contracted the agency for the KisselKar in Mexico. A carload of Hundred Point Sixes and Kissel Trucks have been shipped to the Mexican boundary, where they will be reloaded for forwarding to Mexico City.

Movies to Reduce Accidents—The Ford Motor Co. is using motion pictures to reduce accidents in its factory. Factory scenes are shown to display the more common accidents. Special emphasis is placed on the need for care on the part of each man, though the value of mechanical safeguards also is displayed.

Turns Out Fifty Tractors—The Reed Foundry & Machine Co., Kalamazoo, Mich., is building fifty tractors for delivery this year. The Reed tractor plows with two or three plows and has belt power for various farm machines. The company has a patent for a device that permits the engine to lift as well as carry the plows.

French in California Company—The California Vaporizer Co. has been incorporated at Los Angeles, Cal., with L. E. French, formerly with the Hupp Motor Car Co., in charge of the research and dynamometer laboratory as president and manager. The company will market a heavy fuel outfit for Ford cars. The outfit will operate on gasoline, kerosene or distillate and will be made

on the Pacific coast. Other officers are: Vice-president and secretary, S. B. Brown; treasurer, C. E. Welch.

Brand Gets New Appointment—H. Russell Brand has been appointed business engineer of the Springfield Body Corp.

Briscoe Output Increases—The Briscoe Motor Car Corp. is increasing its schedule for the spring and summer by 5000 cars and also will turn out 2000 Redden truckmakers monthly for the next four months.

Russel Company Grants Bonus—Employees of the Russel Motor Axle Co., Detroit, have been placed on a bonus system which will net each worker who qualifies under the conditions of the plan an additional 10 per cent of his monthly wages.

Lamson is Not to Move—The Lamson Motor Truck Co., Chicago, announces that it is not negotiating with business men of Matteson, Ill., to move to that place, as an item in MOTOR AGE of May 10 stated, and has made no proposition such as was quoted.

Gorey Gets Warner Gear Agency—Joseph C. Gorey & Co., New York, have obtained the eastern agency for the products of the Warner Gear Co. and will carry all standard transmissions, control sets, clutches and steering gears in stock for immediate delivery.

Under A. B. C. License—The Brush Bros. Eng. Co. has obtained the right to use the three-point drive by belt around crankshaft, gear and fan in some of their designs. The patent is owned by Alexander Churchwood, president of the A. B. C. Starter Co.

Fageol Truck Designs Completed—Cornelius T. Myers has completed the designs for the 3½ and 5-ton motor trucks for the Fageol Motors Co., and quantity orders for materials have been placed. Fageol is pushing the truck production and expects to ship 2-ton trucks this month and larger trucks by June.

Launeau Joins Pan Company—Victor Launeau has been made chief motor car designing engineer of the Pan Motor Co., St. Cloud, Minn., a new concern organized under Delaware laws for $5,000,000 to manufacture motor cars, trucks and tractors. Launeau formerly was research engineer for the Buick Motor Co.

New Wheel Company—The Deshler Auto Spring Wheel Co. has been organized at Deshler, Neb., with a capital of $100,000. The organization will manufacture a steel spring wheel patented by W. Nance, a machinist, who is president of the company. George Langs is vice-president, H. Schlamann, secretary-treasurer, and H. J. Struve, director.

Standard Equipment Builds—The Standard Equipment Co., Cleveland, Ohio, a $300,000 corporation which is an outgrowth of the Horton Co., has started work of construction on a plant to cost $150,000. The company manufactures bow sockets for motor cars, hoisting apparatus for drum trucks and starting equipments. Officers are G. G. G. Peckham of the Ohio Buick Co., president and general manager; Walter C. Baker and Fred C. Dorn of the American Ball Bearing Co., treasurer and secretary respectively.

Tractor Company Formed—A company has been organized at Sandusky, Mich., to manufacture tractors, known as the Michigan Tractor Co.

Goodfellow to Standard Roller Bearing—A. N. Goodfellow has been appointed western sales manager of the Standard Roller Bearing Co. with headquarters in Detroit.

Franklin Shipments Gain—The Franklin Automobile Co. shipped 143 per cent more cars in the six months ending May 1, 1917, than it did in the previous six months.

Keyes to Standard Parts—J. F. Keyes has been appointed engineer for the Standard Parts Co. Mr. Keyes was formerly experimental engineer of the Cadillac Motor Car Co.

Parker Returns from China—Walter E. Parker, president of the Commerce Motor Car Co., has returned from an extended trip to China, Japan and other points in the far east.

Kennedy with United States Tire—L. W. Kennedy is now special truck tire representative of the United States Tire Co. in the Southern District. His headquarters are at Atlanta, Ga.

Hanson Joins Dorris Company—Carl Hanson, formerly cost and production manager of the General Motors Co., is now cost and production manager of the Dorris Motor Car Co., St. Louis, Mo.

Murphy with Pathfinder—J. G. Murphy, who for the last eleven years has been with the Pierce-Arrow Co., Buffalo, N. Y., has been appointed superintendent of the Pathfinder company, Indianapolis.

Ten Maxwell Trucks Daily—The Maxwell Motor Co. is at present shipping its trucks at the rate of about ten a day. This production will be speeded up as soon as additional equipment can be obtained.

New Company Gets Building—A new company, known as the Sav-A-Live Fender Co., Cleveland, Ohio, will occupy the building of the Worsted Mills Co., Ashtabula, Ohio. The Sav-A-Live Co. manufactures a steering wheel and other specialties.

New Factory at Pontiac—The General Motors Co. is starting the erection of a factory at Pontiac which is to build the General Motors tractor. A steel foundry also will be built, and a tractor assembly plant will be erected on the Pacific coast.

Stephens Personnel Changes—Changes have been decided upon among heads of departments of the Stephens Motor Car Co. H. C. Dunning, assistant manager, has resigned and has been succeeded by C. B. McCool. L. J. Dudley, who has been superintendent of the body plant, has been promoted to general superintendent of the company. H. B. Bell, who has been manager of the service department, has resigned to enter the army, and has been succeeded by E. H. Snavely, formerly purchasing agent. O. T. Lawson has been appointed purchasing agent with H. A. Story as assistant. Willard Smith, time keeper, has resigned to enter the army.

Eighty-six Trucks per Day—Production of the Republic Motor Truck Co. now is at the rate of one truck every 7 min., or eighty-six trucks per day.

Covert to Build in Detroit—The Covert Gear Co., of Lockport, N. Y., will erect a factory in Detroit which will double the output of the Lockport plant.

Driveways of 4103 Cars—The Willys-Overland Co. has driven 4103 cars from its plant so far this year. January 903 cars were driven away, in February 1058, and in March 2140.

G. M. Charters Boat—The General Motors Co. has chartered a large steamer belonging to the Northern Michigan Transportation Co. for transportation of motor cars to ports on the Great Lakes.

To Make New Rim—The Canton Rim Co. has been formed at Canton, Ohio, with a capital of $100,000 to establish a plant to manufacture motor car rims and specialties. A. R. Turnbull and others are interested.

Collins Buys Castings Interests—B. W. Collins, who resigned as sales manager of the Parker Rust Proof Co. recently, has purchased an interest in the Marshall Castings Co. of Marshall, Mich., manufacturer of manifolds and exhaust pipes.

F-W-D Continues to Add—The Four Wheel Drive Auto Co., Clintonville, Wis., will build an addition 100 by 180 ft. in size, a duplicate of the addition completed within the last six weeks. The F-W-D truck factory has been increased in size from 300 to 400 per cent within eighteen months.

Sets Aside Garden Ground—The Willys-Overland Co. has set aside 76 acres of land divided into quarter-acre lots for community development by office employees without charge for land. This will provide 304 private gardens, the only cost of which will be the initial cultivating and seeding by experienced farmers at an expenditure to be divided pro rata. Employees will be given the opportunity to farm their lots individually.

Eagle Brings Out New Engine—The Eagle Macomber Motor Car Co., Gary, Ind., has placed a car on the market equipped with a rotary engine which is cooled by air. The company claims that its product has more than 200 fewer parts than the ordinary reciprocating type of engine. The first car made by the company has been placed on display at Gary.

U. S. Tire Promotes Ward—Joseph Ward has been made district manager of the United States Tire Co. with headquarters at Indianapolis, Ind. He formerly was connected with the Waverly company; served as assistant sales manager of the American Motors Co., and in 1915 became a special factory representative of the United States Tire Co. In his new position he will have supervision over three branches, Terre Haute, Fort Wayne and Indianapolis.

THREE GENERATIONS OF AN AMERICAN CAR—The 1901, 1905 and 1917 models of the White Co., a steam stanhope, steam touring car and the new gasoline model